3.0 Project Approach, Work Plan and Schedule

3.1 Project Approach

3.1.0 Overall Proposed Solution Description

The Lange Group proposes to provide the Bureau of Conveyance of the State of Hawaii with a new, enhanced, comprehensive system for receiving, storing, converting and disseminating information. This new BCIS system will replace the current Regular and Land Court Systems and will offer the State of Hawaii an consistent method of capturing electronic documents and maps by scanning an storing them into a database. The State of Hawaii BOC is pursuing the implementation of a document imaging system to take advantage of the technological opportunities associated with automated storage and retrieval. BOC users will be able to retrieve these documents online, view them at different magnifications, and print them. The system will have backup and recovery capabilities so BOC will not lose valuable documents and will have security to prevent unauthorized use and abuse. The system will have redundant hardware and employ mirroring techniques to ensure around the clock access from a usage perspective. The BCIS will take advantage of the already installed SP consolidated server at ICSD. BOC users on neighbor islands will have remote access to BCIS and the public will be able to access a limited set of BCIS capabilities from the Internet.

Although The Lange Group has declined to provide services for Part 2 Load Back Microfilm Images, we have included services to work with the appropriate vendor of choice in planning, and implementation of their images import. Theses services are further described in Task 7b, Backfile Microfilm Integration.

Task 1 – Implement BOC Network

Task 1 will involve the implementation of a high speed data network for the BOC, high performance desktop workstations and printers, and an NT based file and print server.

The data network will be a switched Fast Ethernet 100 Mb based LAN, which is more than capable of providing high performance image applications and growing into the future. Workstations will be cost effective, yet high performance 450 MHz Processors, with adequate memory and disk. IBM's Microsoft certified and network professionals will perform the implementation work, as well as connecting with the Windows NT Server.

Task 2 – BOC Requirements Verification

This task requires the verification of the proposed BCIS with the operational requirements of the BOC. This task will consist of performing a structured walk through of specific tasks identified by the BOC, performing a functional comparison of the BCIS with the existing LCATS and General Index systems, and performing a data flow analysis of BCIS that will confirm that all data paths are addressed.

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Task 3 – Replacement of the Regular and Land Court Systems

This task will consist of migration of the WANG VS applications to the new BCIS, as well as creation and integration of a new Regular System Tracking Application. The Lange Group will be using the SPEED II to APPX migration tools provided by APPX Software, for whom The Lange Group is the local distributor. The conversion of all WANG DMS data to the DB2 relational database management system will also be done with 100% conversion effectiveness. Two RS/6000 SP (332 MHz SMP) silver nodes will be installed, configured and tested with the required software including backup, and Database support, by IBM technicians. Remote support will be added to accommodate the existing Title Company access.

Migration Ease, at a Fixed Cost

Migrating SPEED II to APPX allows the BOC to retain thousands of hours and dollars of development resources (application design, user training, data, etc.) into the new system. The migration process is managed and controlled, since all applications being migrated have been developed by The Lange Group. It allows for seamless migration, quickly and correctly while maintaining consistency and stability throughout the business system. All data as well as 100 percent of the applications are moved materially unchanged. This move takes full advantage of continuous, incremental improvements inherent in the new software and hardware platforms.

Fixed fee migration eliminates the risk and exposure of long term, hourly based consulting. The Lange Group understands the basis of the application software and will incorporate features to take advantage of the increased functionality provided by APPX and the new BCIS hardware platform, windows based workstations and web access. All software is Y2K compliant. Of paramount importance, understanding of the BOC environment minimizes migration time and cost, which can be spent in further enhancements.

APPX is a complete, comprehensive rapid application build and change tool for industrial strength applications. It currently runs on many hardware and software platforms, and provides integration with a wide variety of database products including Oracle and DB2. We have chosen DB2 as the relational database to reside on from a "price performance" objective. IBM is known for it's excellent support here in Hawaii, and has proposed a DB2 solution for the State of Hawaii that is very cost effective.

Regular System Tracking - "Piece of Cake"

Task 3 also includes the design, development and implementation of a new Regular System Tracking application using APPX. At least from an implementation standpoint, The Lange Group having already developed a comprehensive Land Court Tracking system for the BOC, the Regular System Tracking will be incrementally easier. This new system will contain the same level of edit checks and ease of data entry, providing access by any BOC authorized user. This new application will incorporate what is currently captured by the UNISYS, eliminating the need for microfiche conversion. This new system will be integrated into the Receiving and Management Reporting modules, further facilitating Double System Recordations. A quicker electronic download of the General Indexes can be made to the companies currently receiving magnetic tapes or a CD-ROM can be written, relieving the

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ICSD from these clerical data transfer functions, and speeding up turn-around time to these companies. In general, this new Regular System Tracking application will provide the BOC with more timely access to recorded information which can now be offered to BOC's customers and the General Public.

Task 4 – Implementing Imaging Capability on the BOC Network

Task 4 imaging will consist of image and data capture, long term storage and image retrieval. To develop the overall solution for this task, the project team will use Kofax's Ascent Capture Software, for the front-end data and image capture along with IBM's ImagePlus VisualInfo for long term storage and retrieval. This phase will also include writing the images out to the Kodak 4800 image writer as part of long term storage to meet legal and archival requirements.

Kofax Ascent Capture

The key to Ascent Capture is its powerful batch manager and administration. With Ascent, system administrators use a simple menu-driven user interface to define processing procedures and rules for each type of document. This ensures that every document is scanned and indexed the same way and reduces operator-training requirements, ensures consistent quality, and simplifies system management.

This modular solution contains the following components: Scan, OCR, Index, Rescan/QA and Release which makes the index data available to thecustomer's business application. In addition, the Release module interfaces to the VisualInfo long-term storage software for archive and retrieval purposes of the image and index data.

In Brief Ascent Capture

- Provides a scaleable client/server platform suitable for low to high volume processing

- Supports both single- and dual-sided scanning via high-end video and SCSI interface models from BancTec/TDC, Bell+Howell, Fujitsu, Kodak, Panasonic, Photomatrix, and Ricoh

- Automatic document separation, in the form of bar codes and patch codes, helps to speed the processing of scanned documents.

- Includes the industry's best image processing, bar code reading, and optical character recognition (OCR).

- Provides a Visual Basic compatible macro language allowing very powerful access to system resources outside of Ascent Capture, including the ability to open an external database and validate entered values against a database or document manager.

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The Ascent Capture software will be used for the image and data capture portion of the design.

ImagePlus VisualInfo

ImagePlus VisualInfo is a member of IBM's EDMSuite family. VisualInfo can manage business documents that include information of many types including image, graphics, audio, video, spreadsheets, and word-processing text. VisualInfo is a key component of our EDMSuite family, which encompasses a variety of disciplines, including imaging, workflow and COLD technology. This is a strategic product area focus for the IBM Corporation.

In a traditional library system, the library contains a card catalog, the actual books or objects, and the readers or clients of the library. In VisualInfo, the same concepts are used. Business documents will be cataloged (indexed) in the NT Library Server and images will be stored the VisualInfo NT Object Server. The servers will be accessed by a functionally-rich Windows/95 or NT client which provides access to all library services including document organization, management and on demand delivery of information.

In Brief VisualInfo

- Provides a scaleable client/server platform suitable for small workgroups through large enterprise solutions.

- Allows easy-to-use, advanced document management supporting a range of object types including image, spreadsheets, word-processing text, audio, and video clips.

- Provides basic work management capabilities to support business process re-engineering.

- Provides hierarchical storage management for automatically moving images between storage devices such as magnetic hard drives, optical, and tape.

- Provides robust system services to bring industrial strength solutions to the LAN environment.

- Includes industry specific and cross-industry offerings from business partners and IBM Service organizations.

- Provides Windows 3.1, Windows 95, Windows NT, OS/2 and Internet/Intranet clients

- Provides unconstrained distributed document storage to access information rapidly and efficiently.

- Includes an OPEN design enabling integration of line-of-business applications and complementary offerings to provide functional extensions.

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The VisualInfo product will be used for long-term image storage and retrieval for the design of BOC's Image system.

Task 5 – Implementing Imaging Capability to BCIS

In this task, the integration of images captured into the VisualInfo DB2 database will be integrated into the application, network and the operation of the BOC. This shall include the capabilities and requirements identified in Section 3.6 IMAGING REQUIREMENTS of the RFP. In addition, update functions will be created which will check that the links between the Text data and the Images are synchronized.

At this point, the BOC users will be able to pull up a record in either Regular or Land Court and be able to "hot key" up the associated document in another window on their PC. All the functionality provided on a standalone basis in task 4, will now be available to any BOC user with the appropriate access level.

Task 6 – Enabling Remote Access to Text Data

In this task, we will provide additional components for remote access to the BCIS text data for neighbor island BOC locations. This will allow any BOC user in the five remote locations, via a high speed data line, to perform the same functions as if they were in the Honolulu office, accessing text data only, based on their logon security. The neighbor island users will connect via a cost/performance effective solution like Frame Relay with T1 and ADSL.

- This task includes setup of the five remote locations to each be outfitted with a DELL PC 450MHz with 64MB SDRAM, 6.4GB of disk, and a 17" color monitor. Also, a Lexmark 12PPM Laser Printer will be attached so that remote printing would be possible at these neighbor island locations. The same equipment at the remote locations are also proposed for the Honolulu BOC, so that users will be familiar with the hardware operations. These same hardware components already exist in the State Parks Division. Connecting this hardware to the BCIS will be additional network components consisting of Cisco Routers to support frame relay access.

Task 7 – Enable Remote Access to Image Data

This task provides additional access to the BCIS image data for Neighbor Island BOC locations. This will allow any BOC user in the five remote locations, via a high speed data line, to perform the same functions as if they were in the Honolulu office, accessing both text and image data, based on their logon security.

The Neighbor island users will now be able to utilize the image applications developed in task 4 and made available to the local BOC users during task 5. The neighbor island users will connect via a cost/performance effective solution like frame relay/ADSL.

Task 7 b – Backfile Microfilm Integration

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The microfilm back-file conversion will play a crucial role in the successful implementation of the imaging system. The benefits expected from the document imaging system will be fully realized when the system contains a full complement of active document images, which will enhance the dept of information that the BOC can easily offer.

We intend to perform the integration of the images and data provided by the vendor chosen by the BOC to complete Part 2, Task 12 Load Back Microfilm Images at this step. We feel that addressing this task after the BOC has implemented it's image entry component, will give the BOC a chance to revise procedures and understand the processes including stabilizing it's own image and data entry and retrieval processes. We will provide this chosen vendor with needed specifications in order to correctly integrate their images into the BCIS. We will also design procedures and provide a customized import program that can be used by the BOC to update the BCIS with the images and data from the vendor, in a controlled, systematic environment.

Task 8 – Enable Public Access to Text Data

In this task, we will provide additional components for Internet access to the BCIS text data for the General Public utilizing a PC containing a common web browser (like Microsoft Internet Explorer or Netscape Navigator). During this task two additional servers, the Public Access web server and a separate firewall, will be added to the rack installed in task 1 containing the BOC network server. The firewall will provide secure only access to the BCIS for the public. We will interface the Web Server and the Firewall to the Internet using Cisco Routers.

A Public Access Web Server, accessing the back end BCIS applications via DB2 Queries, and IBM ContentConnect's Web based image retrieval system, will contain the web enabled java application which will drive the end user search and retrieval of text data. We will provide the Java based application which the BOC/DLNR web page will link to.

Task 9 – Enable Public Access to Image Data

This task is like task 8, but provides for additional access to the BCIS image data over the Internet for Public Access. Anyone accessing the BCIS over the Internet with a PC containing a common web browser (like Microsoft Internet Explorer or Netscape Navigator) will be able to access both text and image data from the BCIS. All hardware and software components will be in place. There are no additional hardware or software components that are needed from this point.

Task 10 – Data Remediation

Back file conversion of General Index data contained on the ICSD mainframe since 1976 will be converted and imported into the new BCIS, and therefore be available to authorized users and the new General Index search module. We will work with ICSD in obtaining magnetic tape or other compatible electronic media to accomplish this. The records provided will be scanned for missing fields and an exception report of these records will be provided. Alternatively, if the Part II, Task 12 vendor provides this information as part of their submittals along with the 10 years of microfilm to image conversion, we will provide the import program to read their information and update the BCIS accordingly.

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Task 11 – GIS Requirements Study

This task involves the formulation of a proposal based upon the needs of the DLNR to store or access GIS map data (plat maps). This involves presentation and submission of a written report that is clearly understood to DLNR. This report or "proposal" can be used as a basis for a GIS RFP, if needed. Basically this entails conducting a study toward later implementation, and will include options and suggestions. This does not involve submitting an actual plan or cost estimates for a functional GIS system, but rather to define "System Requirements" and present "System Design Alternatives" (physical design which indicates task for each alternative that should be considered).

Task 12 – Load Back Microfilm Images

The Lange Group has declined to provide services for Part 2, Task 12 Load Back Microfilm Images, but we have included services to work with the appropriate vendor of choice in planning, and implementation of their images import. Theses services are further described in Task 7b, Enable Remote Access to Image Data.

3.1.1 Task 1 Proposed Solution

Task 1 – Implement a Basic BOC Network

Overview

The first requirement is the implementation of a basic network to tie together the local PC workstations at the BOC. A Windows NT file and print server will be installed in this task. This server would enable sharing of LAN printers for non-BOC application usage, such as word processing and spreadsheets. This server also would provide a place for some other shared applications, such as central storage of Microsoft Office applications. Optimally we have proposed a dual CPU Server which has two P3 550 MHz Processors, 256 MB RAM, and six 9.1 GB RAID enabled hard drives. This server would be located within a rack that will also house the future Internet Web and Firewall Server planned for Task 8, and will be attached to the network through one of the 100 Mb Ethernet hubs. This server will also serve as the image capture server in Task 4. Services to install this server are included in our price.

The basic components required for this phase include:

- A Fast Ethernet network to span the RS/6000 SP Consolidated Server at ICSD, and the BOC offices on the first floor

- Thirty three additional DELL P3 450MHz PC's with twenty eight 17" monitors and five 21" monitors to act as workstations for BOC personnel which will replace their WANG workstations

- Printers both HP LaserJet 24ppm printers and Lexmark 12ppm printers

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- Cabling to support the Ethernet Network

The solution is as depicted in the drawing entitled "Task 1 Schematic."

The PC's themselves will be image capable. That is, they will have enough memory, CPU, and disk to support the image application when loaded. To this end, we recommend DELL P3 450 MHz CPU's, with 64 M RAM memory, and 6.4 GB disk. There will be a mixture of 17" and 21" monitors for regular and image intensive users. While smaller machines would be adequate initially, the price difference is not great enough to offer a significant advantage. For the future it is best to get a sizable machine today. PC's will require Windows 95/98 with software to support TCP/IP access to the BOC's RS/6000 SP silver nodes. In this initial phase, the PC's will emulate VT100's to the RS/6000 SP nodes, utilizing telnet. Essentially, the PC's will strictly act as terminals accessing BOC applications on the RS/6000 SP silver nodes.
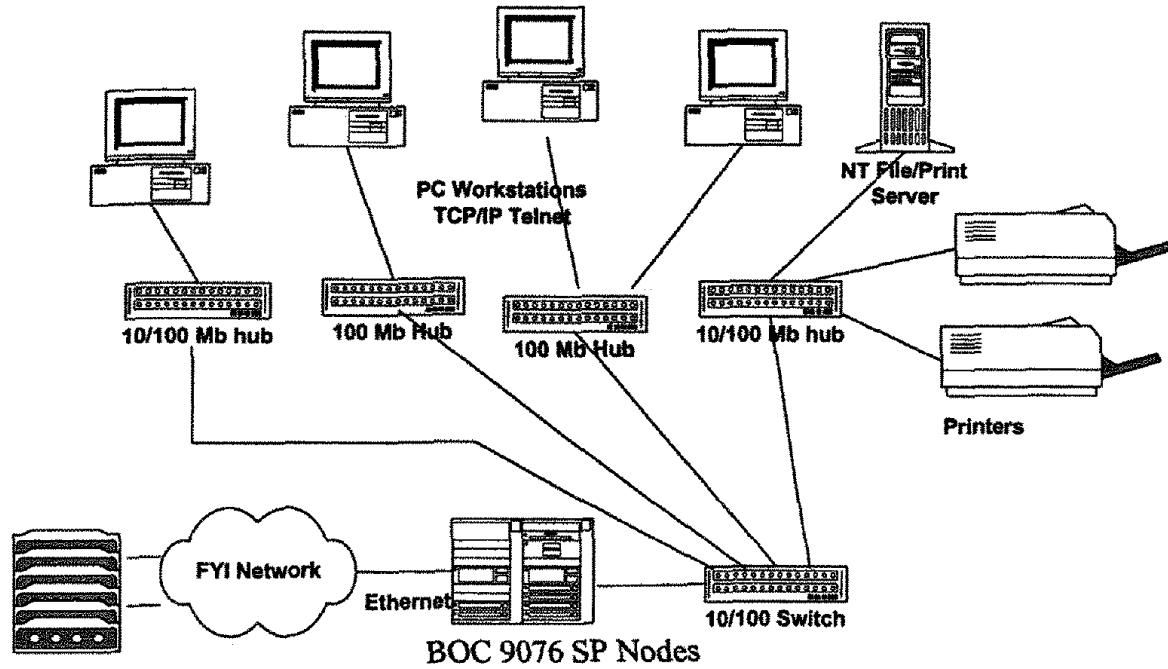
Cabling in support of this Ethernet network will be a combination of Category 5 Twisted Pair copper cabling, and 62.5 micron Fiber Optic cabling. The Category 5 cabling will be used to connect the PC's to the hubs, and is certified for 100 Mbps operation. The Fiber cabling is to connect the ICSD Ethernet Switch to the First Floor hubs.

Recommended Components

- 1 24 port 10/100 Ethernet Switch with redundant power supplies
- 4 24 port 10/100 Mb hub with fiber uplink
- 4 100 Mb copper to fiber converters
- Two 10/100 Ethernet Adapters in each RS/6000 SP silver node
- PC's with 450 MHz CPU's, 64 M RAM, 6.4 GB Hard Drives, 10/100 Ethernet cards, and both 17 " and 21" monitors
- Laser Printers with 10/100 Ethernet cards, or external Print Servers
- Category 5 cabling to each desktop
- 12 strands of 62.5 Micron Fiber cable between ICSD and First Floor (six strands to each office)
- TCP/IP Telnet software for PC's
- Windows NT Server (2 450 MHz Processor, 256 Mb RAM, seven 9.1 GB RAID Hard Drives, 10/100 Ethernet card)
- Windows NT Server Software

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Task 1 Schematic

PC Workstations
TCP/IP Telnet

NT File/Print
Server

10/100 Mb hub   100 Mb Hub   100 Mb Hub   10/100 Mb hub

Printers

FYI Network

Ethernet   10/100 Switch

BOC 9076 SP Nodes

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3.1.2 Task 2 Proposed Solution

Task 2 – BCIS Requirements Verification

This task will consist of performing a walk through of the current operational environment at the BOC in order to obtain greater understanding of the current workflow of the BOC and to review alternatives with the BOC in the way work could be better accomplished. The information gathered will be used to provide detailed design specifications to be used in subsequent phases, as well as serve as discussion points to work with BOC staff in ascertaining expectations, and how they envision their new BCIS. The system implementation time table will be determined in this task.

With the advent of new equipment both on the desktops, and throughout the network, it will be critical to re-analyze the impact to the operation of the new changes at every step of the way. Also, the most important ingredient to any successful computerized implementation is the close involvement of the end users of the system. Here we will gather information from the BOC staff and insure that input, provided to all phases, is user driven.

Given the proposed contemplated approach in each phase, we will be involved in "reality checks" as it relates to the mission-critical applications and the BOC. It must be *their* system, with our help to insure that the overall implementation will net the greatest degree of enhancement to the BOC operation as a whole. The enhancement process to provide greater functionality may negate other concerns previously encountered. Therefore, we must keep an open mind from the beginning, and begin to fashion and evolve the new BCIS into a tool for optimal operational efficiency, from the BOC's perspective.

We will conduct analysis and requirements evaluation, to review the enhancements prior to design and re-design of the existing LCATS, Receiving – Labels and Cashiering applications, and before the new Regular System Automated Tracking application is written. This is to insure that the BOC will be involved in the detailed design aspect prior to changes and new development takes place.

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3.1.3 Task 3 Proposed Solution

Task 3 - Replacement of the Regular and Land Court Systems

Overview

The Lange Group is the original developers of the complete Land Court Automated Title System for the BOC, and since 1987, has been providing annual support and enhancements to LCATS through this day. Included as an enhancement to the LCATS system, in 1990, was the development of the Hawaii FYI module for public access. Since then, The Lange Group has worked closely with the BOC to further develop the Receiving and Accounting Modules which facilitate the Receiving process of both Land Court and Regular System in the Document Time & Numbering, as well as Cashiering, Accounting, and Management Reporting. BOC electronic backlog during The Lange Group's early involvement was measured in years. Today, it is measured in months. Technological and application enhancements are needed now to take the next step towards a more efficient BOC.

Migration of the BOC's tailored application from the WANG to the BCIS residing on a framework of enhanced technology from IBM, made the most sense. This move would take full advantage of the continuous, incremental improvements that have evolved over the last 10 years and minimize the risks associated with new implementations. All data and 100% of the programs will be migrated, providing a seamless move to the new BCIS. The BCIS would continue to provide for the Hawaii FYI links to the LCATS subscribers.

A new Regular System Automated Tracking module and General Index will be designed, developed and implemented during this phase. It would contain a smaller subset of information with functionality similarly found in LCATS. It will fully replace the functions currently performed on the UNYSIS. This information along with what we already capture in LCATS, including enhancements, would provide a new front end General Index search module, which can replace the microfiche hardware and processes from this day forward, and provide greater search capabilities to the General Public.

Enhancements to the migrated applications will be made after initial WANG to BCIS migration. These enhancements will provide for greater efficiency of the BOC, a higher level of data integrity and facilitate a more timely response of information to the BOC customers. The Lange Group will perform evaluation and analysis of the existing system early on, and suggest ways to re-engineer the BOC workflow so that information will be captured at the most optimal time, by the appropriate or elevated skilled person, geared to minimize task overlaps. The re-engineering will take place gradually as the project life cycle moves from Phase 1 to other phases, such as Image scanning and image-enabling of the Land Court and Regular System tracking modules. Once all of the BOC's internal operational software is in place, further additional tailoring of the BOC software will be done to provide for neighbor island and Internet access of BOC information. These software enhancements are only possible, and will take full advantage of the new BCIS technological capabilities.

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We will conduct on-going evaluation and analysis at the beginning of each phase where imaging and remote access is implemented, to provide alternatives to the BOC, as this and other phases evolve and are implemented.

Detailed Description

Migration of Wang VS Applications

Our first step will be the migration from the Wang VS to the IBM RS/6000 SP silver node, the new BCIS. Migration would involve the conversion of the existing SPEED II applications, including all associated data, to the APPX environment, a SPEED II equivalent on UNIX platforms. The familiar applications (K03) LCATS and (K06) Receiving/Accounting will be moved 100% to the new BCIS. Impact to the BOC users will only be in the form of navagation issues. The screens will look the same to LCATS and Receiving users, to begin with, with no changes in processing at the onset.

The data will be prepared using SPEED II utilities, into export flat files on the WANG to be transferred. These PC's with WLOC or serial connections to the WANG must also be attached to the BCIS, and have adequate disk storage. Benchmark timings will be performed to estimate the download times as well as byte and record counts will be verified during the migration. WANG transfer utilities, already in place at ICSD (such as Lightspeed gateways or Wang PC/LIS-PC/VS transfer utilities) will be utilized to download the export files to PC's. FTP will be used to transfer these flat files from the PC to the BCIS. On the BCIS there will be an APPX import utility that will update the DB2 database. DB2 would already have been setup during the BCIS installation at ICSD. The data import would be a two step process. There will be a front-end update that will take the data from the WANG to the BCIS prototype test region as regular DMS based files, then the actual import of the files into the relational database, DB2 will be done. There are two data conversions planned for this phase. The first will entail conversion of all master tables such as the (K03) Glossaries, Assistant Registrar Tables, Document Class, etc., and the (K06) Client Companies, Source Codes, Parameters etc. to facilitate BOC parallel testing. The second will be the final cutover where all data files will be converted.

The migration of the application and data files will be 100% consistent, so the new BCIS will be operationally seamless to the BOC end-user. All enhancements will be year 2000 ready prior to testing.

During the initial testing of the migrated applications, all master tables will be available and all other database tables will be initialized to simulate "Day 1" on the BCIS. The BOC will begin to parallel the daily data entry routines to validate that the migration has been completed successfully and to familiarize themselves with the new BCIS environment. This testing phase is scheduled to run for a maximum of three months.

The Hawaii FYI connection will be checked during this test period as well as all other network and peripheral connections, such as printers. The BOC's Data Processing personnel should be included to aid in the installation of the Microsoft and terminal emulation software residing on the individual PC's. RS/6000 system utilities such as the ADSM backup and processor/volume group takeover will be tested. Other administrative functions such as physical file level security and definition of user logons will be completed

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with help from ICSD. Any issues requiring work or problems reported by the BOC during the testing phase will be handled in an expeditious manner.

The Hawaii FYI subscribers would be provided with new instructions regarding configurations and suggested software that is needed to logon to the BCIS, along with a cut-over date when determined by the BOC. Software required will be easy to obtain, "off-the-shelf" type, but at minimum will be capable of VT100 terminal emulation and print file transfers which will occur simultaneously over the same dial-up line.

The existing Wang printers will be replaced by various low volume Laser printers, located throughout the office, and a few high volume printers centrally located as is currently done. In addition, six new label printer will be recommended for purchase, which would be capable of printing bar codes as well as other additional recording information. We will aid the BOC in redesigning the labels and phasing in the acquisition of the new label printers thereafter into the daily Receiving process.

Because it is outside the scope of this Proposal to address Wang Office, the statewide e-mail system, BOC users of this application should continue to have an icon on their desktop to access the Wang VS, if they currently do so, or need to. Also, the BOC would continue to use stand-alone Word Processing capabilities at the desktop level.

Replacement of Regular System and General Indexes

A new Regular System Automated Tracking application will be designed, developed and implemented. The new system contemplated would replace the existing UNYSIS and all microfiche related processes and equipment from this point forward. There will be an input screen which, like LCATS will already contain the recording and cashiering information for each document. The indexing clerk will call up the document number and, as before, will enter Grantor/Grantee information and other new fields determined in the Enhancement phase. All fields previously entered during the Recording and Cashiering step will be readily available. The following fields will be entered: grantors names; names and addresses of grantees/others; martial status and description of secured interest. Other data entry techniques such as the use of the LCATS glossaries will be provided for faster error-free data entry, such as frequently used names. Redundant, or double key entry will be considered here to insure data integrity. This screen will also serve to facilitate manual entry of prior year's history.

A quicker electronic download of the General Index information containing both Regular System and Land Court, can be made to the companies currently receiving magnetic tapes daily, relieving the ICSD from these clerical data transfer functions, and speeding up turn-around time to these companies. A CD-ROM can be written periodically, such as annually, and offered at a fee, to other entities that wish this media form.

There are several different alternatives that the BOC can explore regarding historical incorporation of data collected on microfiche or other media forms, back to 1976. The Lange Group will conduct on-going evaluation and analysis at the beginning of this phase to provide alternatives to the BOC, as this and other future phases are planned and implemented. The fundamental premise underlying information that will be collected and stored by the BCIS is that it can be relied on.

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Enhancements to Land Court & Regular System

Fields currently being captured or produced at the Labels Time & Numbering or Cashiering process would be saved within each document record for both Land Court and Regular System. These fields include the Conveyance Tax purchased, HRF fees, noted on TCT's, new TCT issuance, LCO, Decree, date and time of recording, document class and island code. Other worthwhile fields of tracking value to Searchers are, description of secured interest, date of document, grantor/grantee information and Tax Map Key (TMK). There are techniques to utilize these fields so that "chain of title" can be accurately tracked if available. The receiving/indexer will be relied upon to identify these fields on the document, which are determined to be of tracking value. Any cross-reference document information such as original Mortgage document that the Release lifts, or the Assignment of Mortgage reference will be acquired for other search. Unit/Interval number for timeshares should also be considered to aid in timeshare tracking. The search modules will be capable of searching by:

- Grantor / Grantee (where partial names can be searched)

- Land Court Document

- Regular System Document

- Condo Map / Apt

- File Plan / Lot

- Certificate of Title

- Tax Map Key

- Application / Lot

- Miscellaneous (Cross Referenced)

- Mortgage

- Tax Liens / Releases

- Declarations

- Financing Statements (affecting a UCC1)

Fields should be captured as early as possible, given the staff and skill sets. Re-engineering the workflow means consideration would be given to re-establish job descriptions and titles. Data integrity will be of utmost importance so a redundant double key entry technique is recommended. The database will contain multiple paths so that we can optimize the Search times for more complex inquiries. The Lange Group will work with the BOC and their customers, title companies and others, to further determine reasonable

fields and search paths required, so that the database can be optimized to minimize the time spent searching at the BOC.

With this, the BOC may be in a better position to trade-off, Title Searchers time, for more information submitted in electronic form. One option would be that they provide machine-readable information requested on a "fly" or cover sheet for each document being recorded. For bulk-recordings of projects, timeshares etc., this information can be provided to the BOC on diskette or other electronic means, that may replace manual data entry. Note: because The Lange Group has an extensive understanding and working background in the Real Estate related businesses, (i.e. Title & Escrow, Real Estate Sales and Attorneys), including an good on-going working relationship with these types of companies, designing an effective automated data entry system that will be favorable to the BOC and their customers, that will reduce manual data entry by BOC, is attainable.

The Recording "Time & Number" process will be enhanced to allow each clerk the ability to print to a dedicated label machine or any share label machines. These new label machines will replace the existing Wang printers, and will generate a bar code label that will contain the official record number. OR#'s can be Document number, LCO or Decree that will be read in by the scan step during the document Image Scanner. The document number on the bar code will "tie" the image to the actual document information record for retrieval purposes later. Other important numbers which can fit on the bar coded will be added such as Island code, and document class. To facilitate double system recordation's, the recording screen will be changed to allow Land Court, Regular or Double system Time & Numbering to be done in one step, and the generation of one or two labels for Double system will be done automatically.

The Cashiering and Recording function could be combined into a single step as opposed to two separate steps as is currently done. All workstations will be PC based so the two windows can be displayed such that, one window will be in Labels, the other in Cashiering. Thereafter it would be easy to flip between windows. Alternatively, a new "combo" Receiving input screen can be developed which would combine the Recording and Cashiering functions in one step, generating both the bar coded label as well as a receipt. The BOC would be involved in the tailoring of the combined screen. For ease of imaging and handling, the receipt could be printed on a laser printer or continue to be printed on the existing receipt printers for individual over the counter receipts. The actual format of the label will be re-designed to contain fees collected in an effort to eliminate the need for the attached receipt copy behind the document.

Company names would be checked against a "bad checks list" and the system will guard against it at both the Cashiering and Recording levels. A glossary key will be provided in the Labels screen to catch this early on. The Labels File Maintenance of Land Court and Regular System will be consolidated into one screen and allow retrieval and on-line listings by document number, LCO or decree. The reprint of LC and RS labels will also be consolidated.

To facilitate Land Court, if a new TCT is issued during receiving, the system will automatically create (add) the TCT along with captured fields during receiving, to create a "TCT starter". There will be a new function to perform "bulk" TCT updates of a stand-alone type document for the "as listed herein". New TCT can be signed automatically with a laser-printed signature or forms can be designed to facilitate this.

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This step will streamline processing at the BOC which will increase productivity, capture more comprehensive data reliably, and facilitate timely availability of all BOC records.

Selected reports and search results, based on user sort-selection criteria, will contain new output formats which can be written to CD-ROM, and therefore be distributed to the General Public. Two additional output formats are contemplated here. One will be in a format which can be viewed using any text editor such as WORDPAD, on a compatible PC. Another will be a "comma delimited" format which can be used to import to other compatible PC applications such as spreadsheets and databases. Eg. EXCEL, FoxPro, ACCESS. This will provide the BOC's customers with an excellent research database on CD, from which to search titles using powerful "off the shelf" software familiar to them.

Search criteria will also include the cross-reference document, if requested by the user in the selection criteria, which will also display all "sister" documents to those found. Eg. If a mortgage is found, any other document pertaining to that mortgage will also be displayed, such as the Release, Assignment, Assumption, etc.

In the Legal Description of the property, generic verbiage can be displayed automatically in the text area which will be formulated from the information input in the already captured fields such as Apartment No, Lot No, etc., somewhat like a dynamic glossary. The user will be allowed to change the generic text.

Additional changes to LCATS and Receiving – Labels and Cashiering will be further defined by BOC in the Analysis, Requirements and Recommendation steps before any changes are made.

All files will be contained on the BCIS in a better than production class DBMS as called for by the RFP. An industrial strength, robust "relational" database, "RDBMS" from IBM called DB2 will be utilized to store all data. An authorized DB2 database administrator "dba" can define field level attributes and can perform data dictionary and tables changes. The application software provides for multiple level locking (file, record, field) two-phase commit and rollback at the transaction level (within the code), should a transaction fail. Automatic error detection and recovery within the code is build-in to the application software. Large scale file update processes can provide for dynamic file rollback after process failure, where scheduling of these jobs can be controlled. The IBM provided backup software and manager "ADSM" can be configured to automatically archive to Optical and tape based on an aging scheme set in the manager. Complete mirroring of data on disk (duplicate data) will be done so the data is contained on two separate disks at any one time. Major recovery processes, procedures and support will be available to the BOC and to ICSD in the event restore of backup files need to be accomplished.

System Information

Estimated Wang Disk Use and profiles of the largest files:

DISK USE:		#recs	used blks	alloc blks
K06	CONVEY	427,106	29,181	
	CONVEYR	934,541	47,575	
	Etc...			
	Total		77,599	86,144
			(159Mb)	(177Mb)
K03	DAILYLOG	379,353	82,211	96,537
	ENCUMBR	2,102,060	217,123	221,926
	LANDESC	330,818	66,073	66,159
	MISCREF	11,208	491	496
	OWNERXR	345,873	48,296	48,779
	TCTMS	188,314	234,036	301,911
	TRUSTEE	19,877	3,462	3610
	Etc...			
	Total		667,517	759,943
			(1,367Mb)	(1,556Mb)

10 Year Estimates: 16Gb x 1.5 rdbms factor x 2 ten year = 48Gb

Estimated Disk requirement for Regular System and Grantor/Grantee:

REGULAR SYSTEM and GRANTOR/EE INDEXES (10 year estimated at 10Gb)
10 Year Estimates: 10 Gb prior year + 10Gb future ten year = 20Gb

Task 3 Environment Description

- ICSD's IBM RS/6000 9076 SP Consolidated Server to house BOC's Primary silver node

- An optional Standby 2nd BOC RS/6000 SP silver node

- IBM DB2 UDB Enterprise Relational Database, unlimited user license, 2 Developer Edition

- Existing ADSM Backup Software on ICSD's RS/6000 SP Consolidated Server

- APPX Software, Inc. 50 user license, 2 developers

- New Bar Code Label Printers which will replace the existing label printers

- CD-ROM Writers

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- Hookup to the Fast Ethernet network to span the RS/6000 SP Consolidated Server at ICSD, and the BOC offices on the first floor. This network would have already been installed in task 1.

The solution is as depicted in the drawing entitled "ICSD's RS/6000 SP Consolidated Server Configuration with BOC's Nodes"

Remote access for Title Companies needs to be provided through modems to match their existing capabilities. Existing connections are made through Hawaii FYI. Continuing the use of FYI appears to be the most economical and easiest to support, so we are proposing carrying this forward, if at all possible. Today, the FYI connection to the Wang is made through the State's packet (X.25) network. Carrying forward with X.25 is not feasible, so we are recommending the use of a TCP/IP Ethernet connection from FYI. This requires Ethernet ports and a Category 5 Copper-cabling run from the FYI UNIX host to the RS/6000 SP. The Title Company PC's then would be capable of dialing FYI as VT100 terminals and connecting to the BOC RS/6000 SP. Should this not be feasible, other alternatives must be explored, such as providing modems and direct dial lines into the BOC server.

Proposed UNIX ENTERPRISE Server

The UNIX Servers being provided to the BOC are IBM RS/6000 SP (332 MHz SMP) wide nodes that will be installed in ICSD's RS/6000 SP 9076-550 consolidated server tall frame. The 332 MHz SMP nodes (commonly referred to as "Silver" nodes) are a series of new high performance servers, based upon the enhanced PowerPC 604e processor family. The speed of the processors is 332MHz and is packaged for an SMP (symmetrical multiprocessor). The Silver nodes allow for up to 4 of these processors and supports up to 3GB of memory. The memory used in this system is called SDRAM (synchronous dynamic random access memory) and runs at a speed of 10ms unlike standard PC's which use memory that runs at 60 to 80ms. This is one of reasons why IBM was able to keep the cost down on these high performance servers. Level 2 cache, which is important in commercial applications, is quite expensive. Therefore, providing higher speed memory like that used in the Silver nodes, can alleviate putting in a lot of Level 2 cache memory. The Silver node uses industry standard PCI based adapters and mounts in any RS/6000 SP frame. The Silver nodes are packaged in "wide" and "thin" form factors enabling between eight and 16 units per frame of a RS/6000 SP. Dial In facilities to handle the existing Title Company remote access users will also be enabled via the RS/6000 SP's control workstation.

The BOC Primary RS/6000 SP 332 MHz ("Silver") Node for Application, Database, Archive and Retrieval, and Enterprise Backup

There will be two Silver nodes configured for this proposal. The first is the BCIS application and database server, and the second is an optional stand-by CPU. The Silver node was chosen based upon the load requirement as well as for its ability to support multiple high performance adapters, key to good performance. This server called BOC primary will be equipped with 4 processors and 2 GB of RAM. There will be two (2) internal 9.1GB UltraSCSI disk drives, two (2) 10/100 autosensing full duplex Ethernet adapter, two (2) high performance serial storage architecture adapters, and components for integration into the control/management/high availability infrastructure of the existing ICSD RS/6000 SP. The

intention here is to duplicate things like disk drives as well as adapters, which are the components in a computer system most likely to fail.

The RS/6000 SP nodes and AIX (the operating system) provide the facilities to easily mirror the operating system as well as application and data files. In the event of a hard drive failure, the other drive will take over. Failed or failing disk drives, adapters, and other components can be replaced in one node while the RS/6000 SP system is operational so that the other applications running on the RS/6000 SP will not need downtime during service.

The application code, as well as, the database and data will be attached externally to a high performance disk array called SSA (serial storage architecture). This storage architecture was selected over the traditional (parallel) SCSI because of its performance and recoverability characteristics that are unique and superior in this industry. The SSA technology allows for drives to be hooked up via a loop versus the traditional SCSI, which used a bus. As a result, each disk drive has two (2) paths to the adapters, so if one adapter failed, the drive would simply use the remaining path. Each path in the SSA architecture is full duplex, meaning that reads and writes occur simultaneously on each path. Another advantage of using an architecture like SSA is that it does not arbitrate the bus. Contrast this with traditional (parallel) SCSI which is arbitrated, meaning that when a particular disk drive is performing an operation, all other drives must wait until the operation has finished what it has been doing before the next drive can execute it's task. SSA is non-arbitrated, meaning that all disk drives would be able to simultaneously read and write at the same time. This is why SSA will outperform FC-AL (fiber channel arbitrated loop). Although FC-AL has a higher speed loop (100MB/sec), it still has the limitation of arbitration, which slows down the overall throughput. The SSA disks will use AIX striping over multiple disks for performance and AIX mirroring for protection. AIX LVM striping and mirroring is part of the operating system and these features are provided at no charge.

Besides the DB2 database and applications, this server will take advantage of enterprise-wide backup and restore software called ADSM that exists of ICSD's RS/6000 SP Consolidated Server. ADSM will provide two functions: first it will provide industrial-strength backup and restore functions automatically with ICSD's existing automated tape library, the IBM 3575-L12. Secondly, ADSM will perform the control of the optical library, the IBM 3995-C66 for archiving of images.

The BOC RS/6000 SP 332MHz ("Silver") Wide Node for Standby

The second of the two servers being proposed is also an IBM RS/6000 SP 332MHZ ("Silver") Wide Node, which will act primarily as a hot standby in the unlikely event that we suffer a processor failure on the primary BOC node. It's only function will be to provide standby in normal operation. This node will be equipped with two 332MHz POWERPC 604e processors and 2.0GB of RAM. The disk drives used for the system will be duplexed like the primary node and the adapters will be duplicated like the primary. All of the SSA high performance disk drives will be twin-tailed to both servers, so in the event of an unlikely failure, applications and database can be quickly imported into this node for continued usage.

The RS/6000 SP Silver nodes have been configured to be available stand-alone, which mean that precautions have been taken to alleviate problem areas like disk drives, network adapters, and power supplies. Processor failures are rare. If they do happen, it is caught early on in the implementation while the service personnel are "shaking" the machine down. In our experience, only disk drive failures have occurred, after RS/6000 SP have been put into production.

Benefit Summary of the IBM RS/6000 SP Silver Nodes

High performance CPU unit to handle the workload of today and sized for the future

Industry standard PCI bus, key to new technologies

RS/6000 SP Silver is the start of a line of UNIX servers that will grow into newer high performance processors (gigaprocessors) exploiting new technologies like copper interconnect and silicon-on-insulator (turbocharging transistors). This is not old technology; it is proven technology that will allow you to exploit possibilities in the near future

Upgrade to the RS/6000 SP WinterHawk (300MHz POWER3) nodes with growth towards the gigaprocessor. All future processors will be based on the technology used in the WinterHawk nodes, which are 64-bit processors.

There are Silver nodes installed here in Hawaii, so the Bureau would not be the first.

High Performance I/O system in regards to SSA (serial storage architecture), if you have a "hungry" processor you need to make sure you can "feed" it appropriately. SSA is the key to this; no more "waiting on I/O" which is a big performance inhibitor.

Mirror protection, part of the robust AIX operating system

Disk striping for performance, part of the robust AIX operating system.

Redundant adapters for protection against unplanned outages.

First step to full automatic redundancy if/when the Bureau chooses to do so.

ICSD's ADSM ADSTAR Distributed Storage Manager for Backup and Restore

Introduction:

To provide automatic backup and recovery of the BOC's entire SP complex as well as the NT servers, a product from IBM's Storage Division is being proposed called ADSM. Relied on by major corporations around the world, IBM's award-winning ADSTAR Distributed Storage Manager (ADSM) software is an enterprise-wide storage management solution. It includes unattended network backup and archive, Hierarchical Storage Management (HSM), and a Disaster Recovery Manager designed to support business continuance while implementing disaster recovery operations.

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No more "finger pointing" and ease of mind that backups are being performed

ADSM's native intelligence automates a full range of storage management functions. You can tailor data backups and archives via ADSM's policies to specify what data gets backup up or archived, where it is stored and how long the data is kept. Its powerful scheduling feature eliminates the need for manual backup and tracking. You can schedule storage operations to complement ordinary workflow or during off-peak hours to optimize network resources and performance. ADSM's relational database tracks every version of every file. Identifies tape volumes and even manages retention policies. This frees employees for more productive work and help control costs.

ADSM provides backup and archive services for more than 30 different client platforms like Windows NT, AIX, HP-UX, SUN Solaris, Windows 95/98, and a whole bunch more. It backs up and restores distributed data, applications and databases, including DB2, Oracle, Sybase, Informix, Microsoft SQL Server, Lotus Notes and SAP/R3

Since so many corporations run 7x24 operations, they increasingly need to backup data quickly and consistently within a shrinking or non-existent backup window, ADSM includes a wide range of features to speed both backup and restore performance. ADSM supports both full backup and an exclusive approach called "incremental forever." With "incremental forever" backups, the initial backup contains a full copy of all data files, while subsequent ones store only new or changed files. This reduces backup time, network traffic and storage media. But the backup function is only part of the story. Even more important, you can restore data in the event of a failure or disaster quickly and reliably. With ADSM's unique "tape collocation" and "tape reclamation" technologies, incremental backups from one client are placed on the same tape or group of tapes night after night. That way, ADSM can perform a full recovery with minimal tape mounts. This is a fast and reliable way to restore data.

Designed to simplify the job of storing and managing data across today's client/server enterprise networks, ADSM features a graphical user interface (GUI) for end users. It lets users easily manage basic backup and restore functions; supports advanced tasks such as point-in-time restore, progress indicators, enhanced search features, and collapsible directory trees. A powerful Web-enabled administrator interface allows administrators to seamlessly traverse and operate on all ADSM servers on the network from anywhere in the enterprise.

ADSM's centralized control features help companies leverage resources and enhance overall control. Centralized logging of operational data allows administrators to quickly assess the status of storage management operations. Centralized monitoring helps ensure the integrity of ADSM servers by sending alerts and "heart beat" calls to Simple Network Management Protocol (SNMP) managers such as, Tivoli, HP Openview, CA Unicenter and Netview, via industry-standard SNMP traps and Management Information Blocks (Mibs). You can set and store most ADSM client options at the server level. This lets administrators control option settings and group those options among multiple clients to avoid replication. An SQL interface enables access and reporting on ADSM database and real-time ADSM server information. An ODBC driver, available with the Windows 32-bit client, lets you use products like Microsoft Excel and Access, or Lotus 1-2-3 and Lotus Approach to import data, build queries and generate reports.

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ADSM offers a complete, scalable storage management solution for today - with the performance, control and usability features to grow with your needs well into the future.

The RS/6000 family is a scalable, compatible line of RISC UNIX workstations, servers, and supercomputers that are reshaping the way companies operate. This economical family of systems fulfills the computing requirements of many small businesses, workgroups, and large enterprises. Powered by IBM's award winning AIX, RS/6000 has the advanced technology and architecture needed to grow and adapt to the Bureau's ever changing workloads.
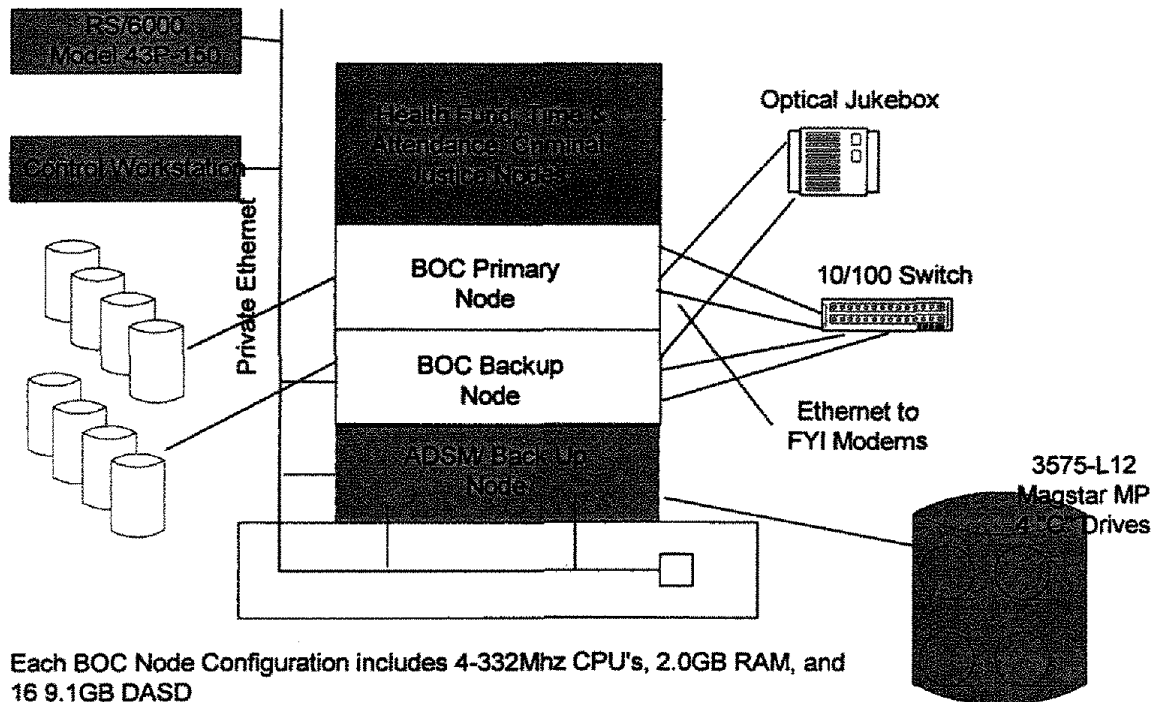
The AIX operating system provides significant functions for high availability. Logical volume (disk) mirroring (LVM) disk controller duplexing and Journaled File System (JFS) to maintain file system consistency and prevent data loss all contribute to highly reliable system environment.

The BOC RS/6000 SP server nodes will be located in the machine room at ICSD (in the existing RS/6000 SP frame). Supporting the RS/6000 SP nodes will be a 10/100 Ethernet Switch. To provide the needed bandwidth for the future image applications, the RS/6000 SP nodes will be outfitted with Ethernet cards capable of both 10 and 100 Mbps speed. There will be connections from each of the two RS/6000 SP nodes to the switch. To provide some level of network hardware redundancy, this switch will have redundant power supplies. Should more redundancy be required, a second switch can be added.

This 10/100 Ethernet Switch will be connected via Fiber Optic cabling to 100 Mbps and 10/100 hubs on the First Floor. There will initially be four 24 port hubs to support up to 96 workstations and printers (48 in each office). Each of the hubs will have a separate fiber attachment to the central switch. This will ensure that failure of one hub or fiber cannot cause more than 24 workstations to fail. PC workstations and printers will attach to these hubs, once again utilizing 10/100 Ethernet Cards, operating at 100 Mbps.

ICSD's RS/6000 SP Consolidated Server Configuration with BOC's Nodes

RS/6000
Model 43P-100

Control Workstation

Private Ethernet

Health Fund, Time &
Attendance, Criminal
Justice Nodes

BOC Primary
Node

BOC Backup
Node

ADSM Back-Up
Node

Optical Jukebox

10/100 Switch

Ethernet to
FYI Modems

3575-L12
Magstar MP
4-x-? Drives

Each BOC Node Configuration includes 4-332Mhz CPU's, 2.0GB RAM, and 16 9.1GB DASD

Shaded items are part of ICSD's Consolidated Server Implementation Project

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3.1.4 Task 4 Proposed Solution

Task 4 – Implementing Imaging Capability on the BOC Network

Overview

The following figure represents the imaging workflow diagram for the BCIS Image-enabled functionality. The proposed workflow is divided into three major areas: Scan and Index Capture, Long-Term Storage/Microfilm Output and Retrieval. The products to be used for the three different areas are as follows:

- Image and Data Capture – *Kofax Ascent Software*

- Long-Term Storage – *IBM's VisualInfo*

- Image Retrieval – *IBM's VisualInfo*

Kofax Ascent Capture Software provides the modules to import the index and image data into the system. The release module in Kofax Ascent posts the data to the existing DB2 BCIS database and the index and images to VisualInfo for long-term storage and will also write the documents out to microfilm for legal purposes. The Lange Group feels that the combination of these two software components will allow for an efficient and timely processing of the incoming documents which will allow the documents to be available for retrieval as quickly as possible. The image-enabling of the application will done by retrieving the image via the document number as the user presses a hot-key within the BCIS application. The following workflow diagram depicts the overview of the image component of the BCIS system:
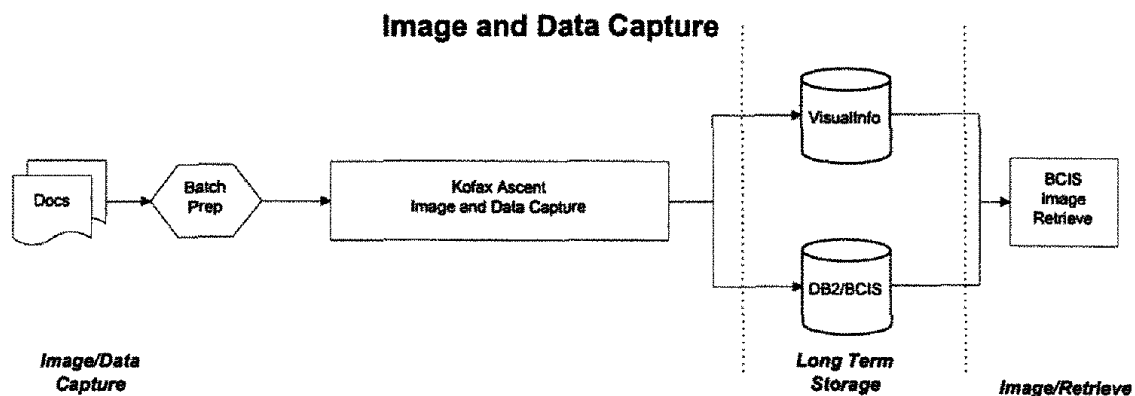
As shown in the workflow diagram above, the documents will go through a batch preparation process that will separate the documents into document type (i.e., Recorded Documents, maps and all other types of documents). The documents will be scanned using a scanner that will create images that will be able to be viewed with the BCIS application. As the documents are scanned, the bar code will be read for index information. This index information will be passed along with the image to the Index module. This module will allow

the user to correct invalid bar code data and enter in the remaining data required for the BCIS system. During this step, the user is presented with the image and the index fields simultaneously to allow for "heads-down" data entry. At this time, the user also has the option to route the document back for rescan if the document has been excessively skewed or is unreadable. After the data entry has been completed, the documents and data are routed to the Release module. The Release module formats the data for storage to the BCIS DB2 database and the images and index data for long-term storage to VisualInfo. During the Release module, images will also be placed in a directory to be imported for microfilm. The images will be written to microfilm using the Kodak Document (microfilm) writer.

At this point, the images are available to be viewed from the BCIS application. The user will press a hot key or accelerator key to retrieve the image that pertains to the document they are working on in the BCIS application.

Detailed Description

The following figure represents the detailed workflow and is followed by a description of each step. In the diagrams, the circled processes represent background processes that do not require user intervention, while the rectangles represent end-user functions.

Image and Data Capture
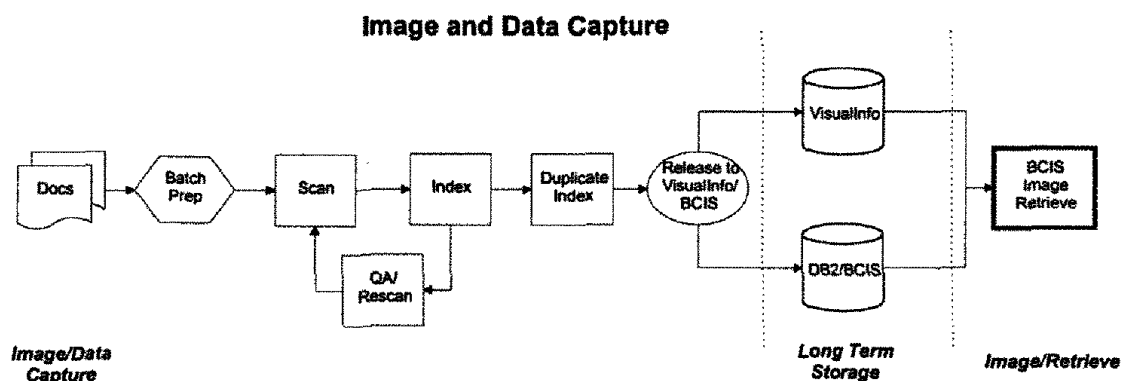
The new imaging process will start with Batch Preparation.

3 0 0 5 0 4

Batch Preparation

For the Batch Preparation step, the diagram shows a simple preparation process that separates documents by document type:
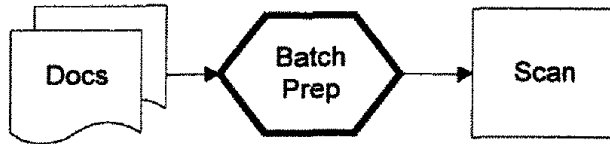
Document preparation is also expected during this step to include:

- Checking documents for damage

- Removing staples and/or paper clips

- Repair damaged documents or copy any torn or ripped documents

- Documents, at a high level, are to be grouped as follows:
- Map sized documents
- All other documents

Maps will be separated from the Recorded Documents into specific batches due to the size of the maps requiring a different scanner. All other documents may be grouped together as the scanner will be able to detect various page sizes within the batch.

Scan

The Scan process is the next step to get the documents into the system.
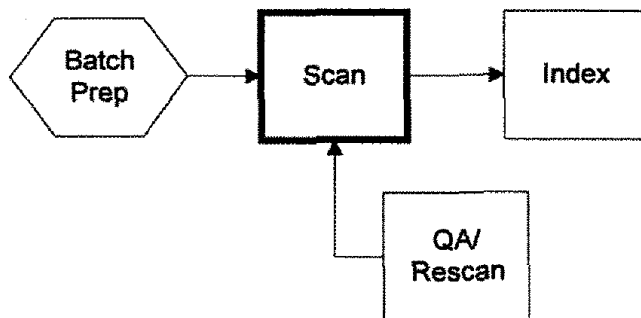
A scan operator will feed a batch of documents of the same type into a scanner. It is assumed that the batches will be grouped together as follows:

- Recorded Documents

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- Map sized documents

- All other documents

This sorting allows the process to select the most efficient scanner for the type of incoming document.

The Scan process supports automatic document separation, in the form of bar codes and patch codes, which helps to speed the processing of scanned documents.

At Scan time, the software will read the bar code on the document and route the image and bar code values to the Index process.

Index

Ascent Capture has a manual key entry process designed for fast "heads-down" index data entry.

```
┌──────────┐      ┌──────────┐      ┌──────────┐
│          │      │          │      │Duplicate │
│   Scan   │─────▶│  Index   │─────▶│  Index   │
│          │      │          │      │          │
└──────────┘      └────┬─────┘      └──────────┘
                       │
                  ┌────▼─────┐
                  │   QA/    │
                  │  Rescan  │
                  │          │
                  └──────────┘
```
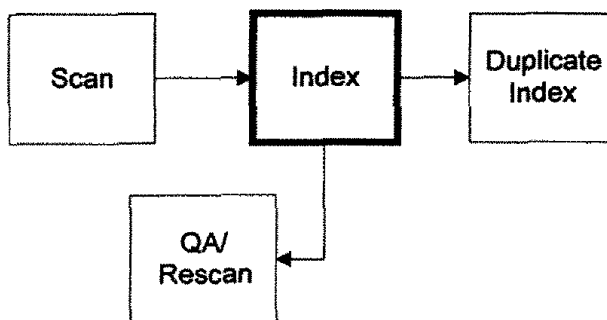
The Index module displays the scanned image, and presents the data entry operator with an elegant, simple data entry screen. The operator never has to touch a mouse – a proven time-waster during data entry. The System Administrator sets up validation of field length and data types through menu-driven choices. During this step, the user can enter the information that was not captured via the incoming bar code.

The index step will include four validations using valid values developed during the Requirements Validation for this task. The validation will occur for the document number, marital status, island code and the document type. This will allow quality control to occur during the index process and eliminate major data changes down the road. During the index step, the index user will be responsible for entering the general index information, which will allow BOC to take advantage of the skill level already in place for the indexing function. Sample index fields include the following:

- Document No

- Number of Pages for this Document

- Date/time of Scan (automatic system time)

- User ID who Scanned (automatic via user logon)

- Grantor name (3 fields, multiple occurrences)

- Grantee name (")

- Marital Status

- Grantee Address

- Description of Property

- Type of Document

- Island Code

After the Index step is complete, the batch is routed to the Duplicate Index module to allow for maximum quality assurance before storing the data to the BCIS system.

For exceptions, if the user detects an unusable image that has been excessively skewed during the scan process or is unreadable, they can route the document to the QA/Rescan module.

QA/Rescan

In the situation where the Index operator finds that the image is unreadable, the operator will route the document to the QA/Rescan module.
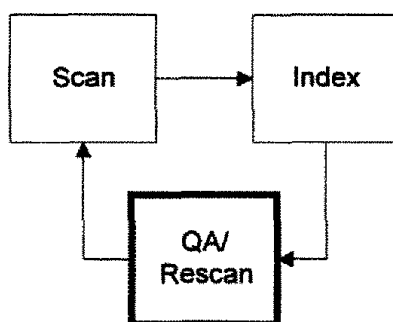
During this process, the QA/Rescan specialist can then edit the batch, rescan and replace a page or document, or delete the entire batch and rescan it. The software determines which documents will require indexing and present these documents for the index operator. The process control between these steps is fully automatic – the index operator does not worry about where the batch is going because the automated batch manager takes care of everything.

Duplicate Index

The Duplicate Index step will allow a user different from the original index user to enter index information for the document.

```
┌─────────┐     ┌───────────┐     ╭───────────╮
│         │     │ Duplicate │     │ Release to │
│  Index  │────▶│  Index    │────▶│ VisualInfo/│
│         │     │           │     │    BCIS    │
└─────────┘     └───────────┘     ╰───────────╯
```
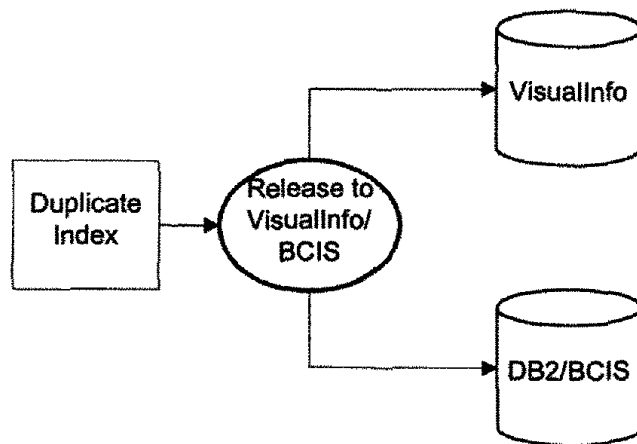
This module can be configured for the user to enter all the index fields that were entered in the Index step, or only a subset of the original information. At this time, the original field values will be compared with the new field values and any discrepancies displayed to the user. Once the batch has been validated, it is then routed to the Release module.

Release Module

The final step for the Kofax Ascent Capture software is to post the data to the DB2 database and the images and index data to VisualInfo.

```
                                      ┌──────────┐
                                      │ VisualInfo│
                                      └──────────┘
                                          ▲
┌───────────┐     ╭───────────╮          │
│ Duplicate │     │ Release to │─────────┘
│  Index    │────▶│ VisualInfo/│
│           │     │    BCIS    │─────────┐
└───────────┘     ╰───────────╯          │
                                          ▼
                                      ┌──────────┐
                                      │ DB2/BCIS │
                                      └──────────┘
```

This Release module is a background process, which will be customized to post the data to the backend DB2 BCIS database. In addition, Kofax includes an interface to IBM's VisualInfo software to store the images and index data for long-term storage. After this module has completed processing, the data is available for the BCIS application and the images are available for retrieval on VisualInfo.

At this time, a copy of the images will be written to a file directory to be imported into microfilm. The Kofax Document (microfilm) Writer will be used to write the documents to microfilm.

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BCIS Image Retrieve

For Task 4, the imaging retrieval will be via the standard VisualInfo Client Application software. Within the VisualInfo Client Application, the user can select to perform a search by any one or more of the index fields to retrieve the appropriate document.
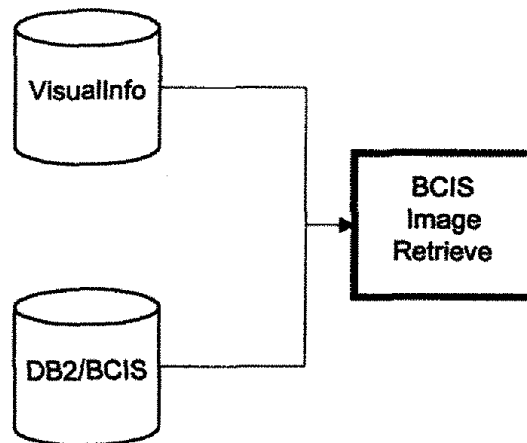
Once the image has been displayed, the user has access to several imaging functions such as print or fax. Additional imaging services include:

- document zoom
- rotation
- paging through documents
- reverse image display
- scale page to size of window

Several annotations can also be used which are stored as an overlay to the image, to keep the image in its original form. The types of annotations available are:

- "post-it" notes
- highlights
- arrows
- free-form lines

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- circles or ovals

- text boxes

- squares

- stamps (similar to rubberstamps)

Thumbnail views can also be used to view the pages of the documents. These views are good for determining if the correct document has been chosen and can also be used to move quickly between pages.

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Task 4 Environment Description

Overview

The system diagram depicted below shows the production Task 4 VisualInfo (imaging) environment to support the image-enabled BCIS application(s). Task 4 will consist of image and data capture, image storage/retrieval and microfilm output. The primary objective of the Task 4 technical environment is to provide the most cost-effective imaging infrastructure to support the BCIS application(s). A key design point of Task 4 is to leverage the preceding phases to minimize costs while still providing high availability and performance. The proposed task 4 design will use the existing Windows 98 end user workstations communicating to the backend imaging servers running on the AIX RS/6000 SP node. This conformity to the planned environments of earlier tasks will also leverage skills and knowledge from those phases for ongoing support. The imaging solution as shown below will also support remote access to images from a WEB-based browser as part of Task 4.

Task 4 Schematic
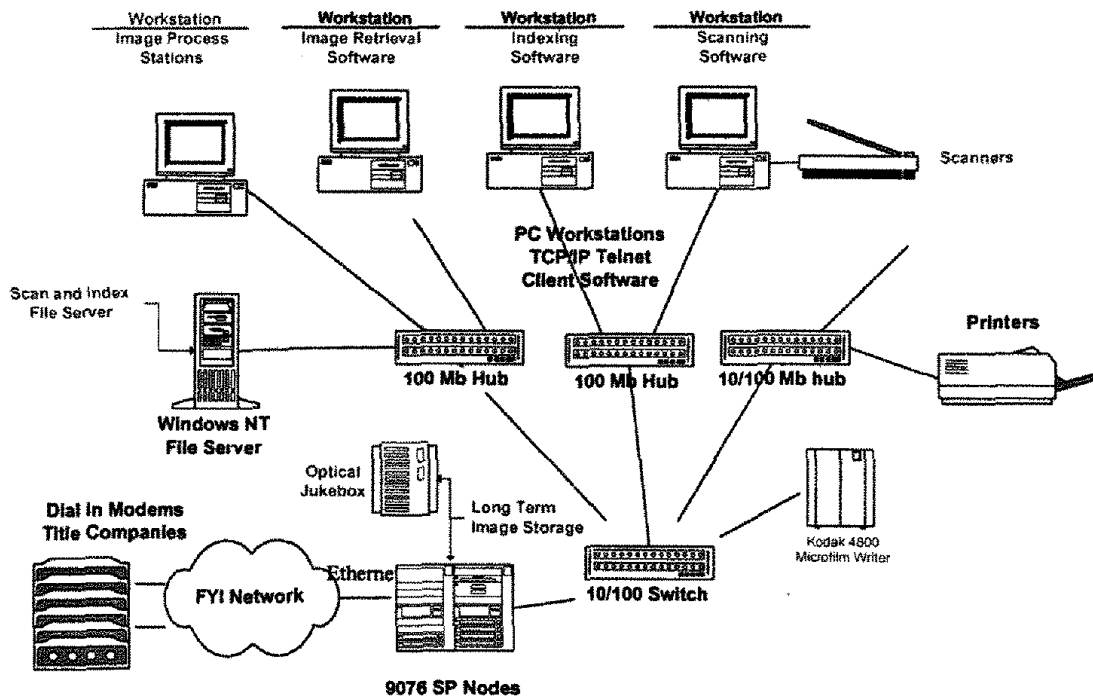
300512

As mentioned earlier, the Task 4 imaging functions will be provide by the following products:

Imaging Function	Product
Scan and Index Capture	Kofax's Ascent Software (IBM Business Partner)
Long-Term Storage	IBM's VisualInfo
Image Retrieval	IBM's VisualInfo

Detail Description

Below are the sizing assumptions used to calculate the CPU and disk requirements for the RS/6000 SP Node.

System Information:

Daily Hours of Operation:
Scanning	8 Hours
Indexing Documents	8 Hours
Processing Documents	8 Hours
Migrating to Optical	8 Hours
Business Days per Year:	260

Client Workstations and Server Proposed:

Windows 98 based:	50
Server Type:	AIX
Years Documents are Retained:	10
Document Definitions	
Items Per Day	1,500
Pages Per Document	10
Size Per Page	70 KB
Days on DASD	30 days
Microfilm Conversion Items	3,000,000 documents (7-10 pages/document)
Daily Ad-hoc Searches:	3,000
Length of all the Key Fields	60

Estimated CPU Requirements

Machine Type / RAM	Function	CPU%
RS/6000, 2 Gig	BCISDB2 and Appl. Requirements	15%
RS/6000, 2 Gig	Imaging Requirements	19%

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Estimated Storage Requirements

Function / Appl.	Volume Group	First Year[1]	@10 Years
AIX and LPPs	rootvg	std internal disk	n/a
Database			
1) Library Server	vi-database	4GB per year	10GB
2) Object Server	vi-database	2.5GB per year	08GB
3) ADSM Server	adsm-database	3.5GB per year	10GB
4) BCISdatabase	boc-database	20GB per year	40GB
Database Logs	database-logs	4GB	10GB
30 Days of Images	vi-images	30GB	30GB
ADSM Disk Pool	adsm-disk	5GB	05GB
Database(s) work area	db-workarea	2GB	05GB

Total Disk Requirements **118GB**

Optical Requirements[3]	n/a	140GB	1.4TB

----

[1]First year of new (scanned) documents
[2]Sized for 10 years of <u>new</u> documents, does not include optical storage for converted microfilm documents

Scan and Index Capture - Scanning software will be added to existing Windows 98 client workstations as well as appropriate scanners designed to handle the different paper requirements. The scanning application as part of Kofax's Ascent Capture is designed to support both simplex and duplex scanners at their full rated speed and comes standard with support for high-speed video scanners via Kofax accelerator boards as well as mid-range SCSI scanners via ISIS drivers. The scan application will run from a client workstation with the scan device attached directly to the workstation. This workstation can also be used to perform other imaging functions, and does not have to be dedicated to the scan function. User friendly Windows panels will prompt the user through the scan options and process. The scanner will be able to run at rated speeds as images are quickly staged to the Windows NT File Server as shown below:

LANGE

Capture Process
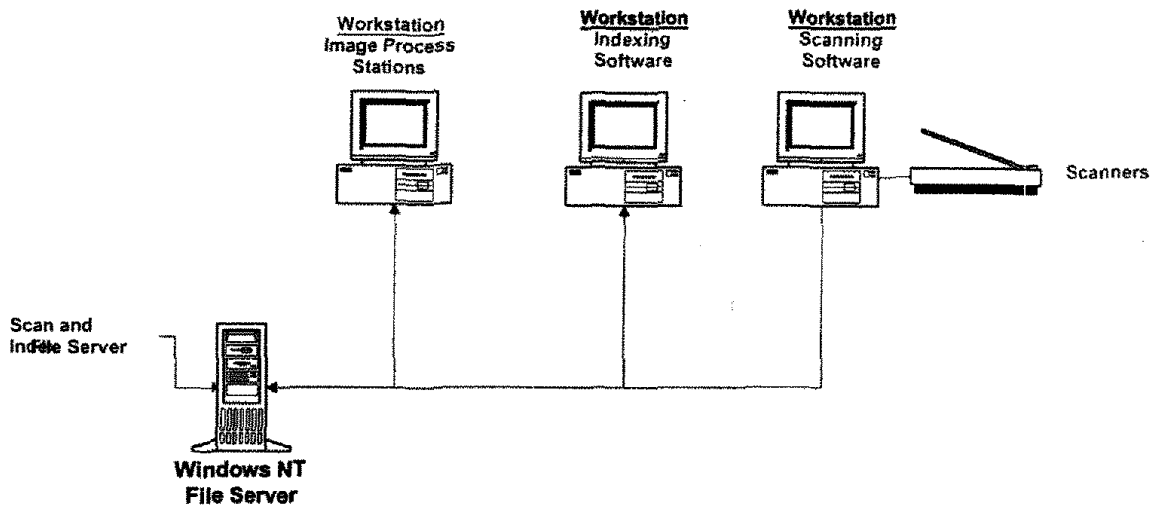
Once scanned, documents will be available to be indexed with users retrieving images from the file server to their local workstation. Indexing information will then be entered and stored back to the file server ready for the next step in the capture process. Other steps in the capture process may include OCR, Quality Assurance and Re-scan.

The Scan and Index NT File Server will be configured with a RAID-5 high availability disk subsystem to retain images through the "Scan and Index Capture" process. At the completion of the capture process the images will be permanently released (stored) to the RS/6000 SP server for long term storage and image retrieval.

While documents are in the capture process a Batch Manager module is used to check the status or control the flow of batches through capture system. The system administrator can use the Batch Manager to create, delete, or open batches. In addition, the administrator can route a batch to a processing module or change the current status of a batch.

The Batch Manager can be used to:

- Display a summary table showing the current status of all active batches in the Ascent Capture system.

- Create new batches.

- Delete existing batches.

- Edit batch properties such as the priority, status, and processing module.

- Invoke a batch's associated Ascent Capture processing module.

- Display a status history of each active batch in the system.

300515

A sample screen of the Kofax Ascent Batch Manager is shown below:

Long-Term Storage

The final step for the capture process is to store the data to the DB2 BCIS database and the images and index data to VisualInfo for long-term storage and write the documents to microfilm. The release module is a background process running on a Windows 95/98 client workstation. After this module has completed processing, the data is available for the BCIS application and the images are available for retrieval from VisualInfo.

300516

Long-Term
Storage

Image Stations

Scan and
File/Print Server

Windows NT
Server

BCIS
Data

Images

Long-Term
Storage

BCIS
Data

BOC 9076 SP
Nodes
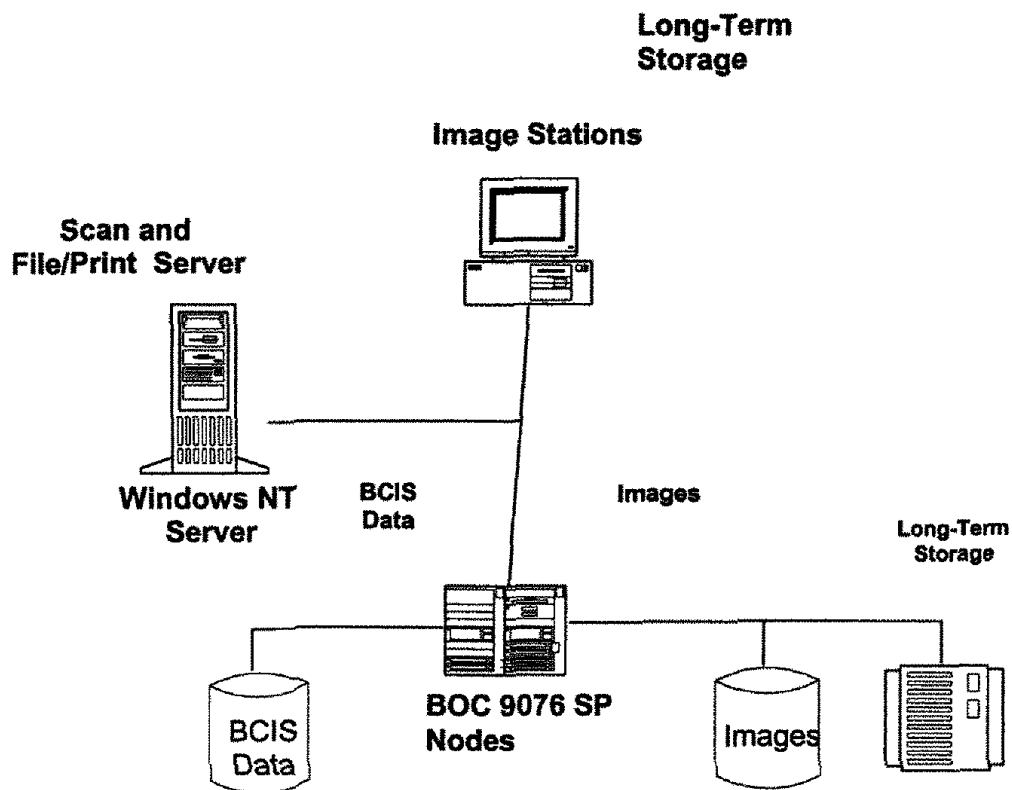
Images

The Task 4 long-term storage solution will leverage the RS/6000 SP nodes installed as part of the Task 3 hardware implementation. Added to the RS/6000 SP node would be an optical jukebox, VisualInfo imaging server software and the Kodak 4800 microfilm writer as shown in the above diagram. The VisualInfo imaging server software is composed of the following components.

- AIX VisualInfo Library Server

- AIX VisualInfo Object Server

The VisualInfo imaging environment is similar to a traditional card catalog library system. The BOC business documents are cataloged (indexed) in the Library Server component while the Object Server manages the physical images themselves. The figure below shows this client/server relationship.

Library Server   Object Servers
                                                and LAN Cache
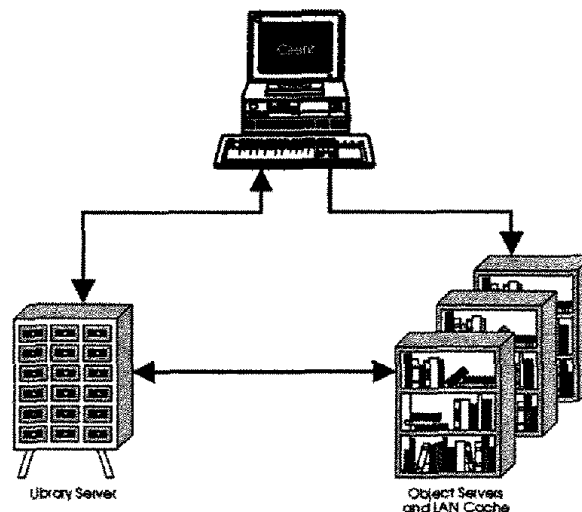
VisualInfo Library Server

This Server will contain a master copy of all of the information relating to BOC image objects. The Library Server will direct requests from the BOC imaging users to the appropriate Object Server(s) to store, retrieve, and update objects within the VisualInfo environment. The Library Server is built on IBM's DB2/6000 relational database technology to provide highly reliable transaction processing with forward and backward recovery. The DB2/6000 database tables that make up the VisualInfo Library Server provides the following functions:

- Indices of all objects stored

- Class information about objects

- Workflow of all objects

- Access control of all objects

- National Language support for all objects

- Administrative information

- Internal operational information

VisualInfo Object Server

The VisualInfo Object Server maintains the stored objects themselves. The Object Server will provide System Managed Storage (SMS) for all objects within the VisualInfo environment. Meaning, the Object Server will initially store images on high availability RS/6000 mirrored disks. This will allow for the most recently scanned document to have the faster access times, compared to older archived documents that reside on optical or tape storage. User defined retention periods, as part of SMS will allow for the automatic migration of objects off the RS/6000 disks to longer-term optical storage and / or tape.

Image Retrieval

From the client workstation, image services are provided through the VisualInfo Client Application running on existing Windows 98 stations. The protocol for all VisualInfo imaging components will be TCP/IP to be consistent with the previous phases and communications standards.

Task 4 Workstation
Image Retrieval
Software

Image and
Data Retrieval

BCIS   **Images**
Data
                                                              Long-Term
                                                              Storage

BOC 9076 SP   **Images**   **Optical**
BCIS   **Nodes**   **Jukebox**
Data

300519
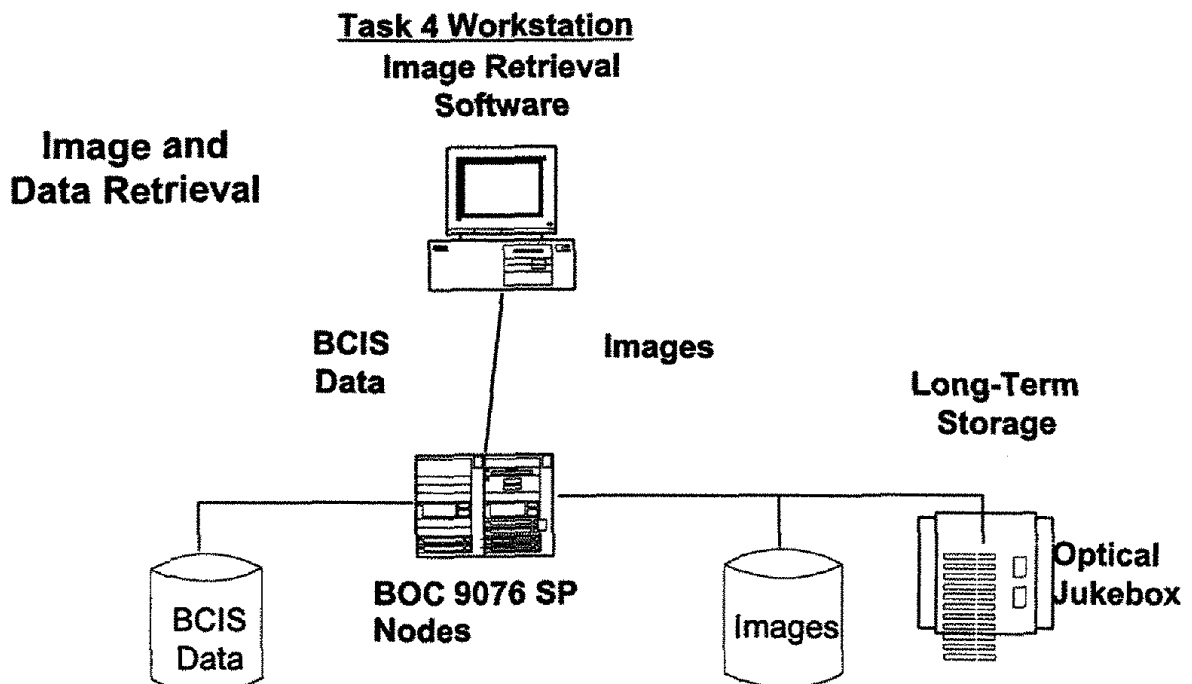
Optical Jukebox

The proposed Task 4 design includes one IBM 3995 Optical Library (jukebox) model C66 with IBM's new 5.2 GB Extended Multifunction Optical Drives for newly scanned documents. It utilizes the IBM 5.2 GB optical cartridges, providing 811 GB of MO rewritable, Permanent WORM, or CCW (non-permanent WORM) optical storage for use by the VisualInfo RS/6000 SP system. The 3995 model C66 includes four 5.2 GB Extended Multifunction optical drives and storage cells for 156 optical cartridges. The 3995 will be SCSI attached to the RS/6000 SP as shown in the diagram below.

**IBM 3995 Optical Library
(jukebox)**

**BOC 9076 SP
Nodes**
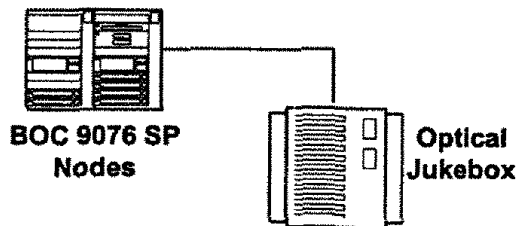
**Optical
Jukebox**

The VisualInfo Object Server in conjunction with ADSM will manage movement of images to and from the optical platters as needed by end users. The location of the actual image(s) will be transparent to the end users as its location is controlled by the VisualInfo Object Server.

The 3995 optical library has an autochanger that moves the optical cartridges among the optical drives, the storage cells, and the entry/exit slot. The model is also equipped with a dual-gripper picker on the autochanger for enhanced performance during the exchange of optical cartridges.

300520

Task 4 Schematic

------------------------------- Task 1 Application Stations --------------------------

Image Retrieve Stations
Qty=n

Indexing Stations
Qty=8

Scan Stations
Qty=2

PC Workstations

TCP/IP Telnet

VI Client Software

NT File/Print
Scan Capture
Server (Qty-1)

Printers (Qty=n)

10/100 Mb hub

10/100 Hub

10/100 Hub

10/100 Mb hub

Dial In Modems
Title
Companies

Optical
Jukebox

FYI Network

Ethernet   BOC 9076 SP
Nodes

10/100 Switch
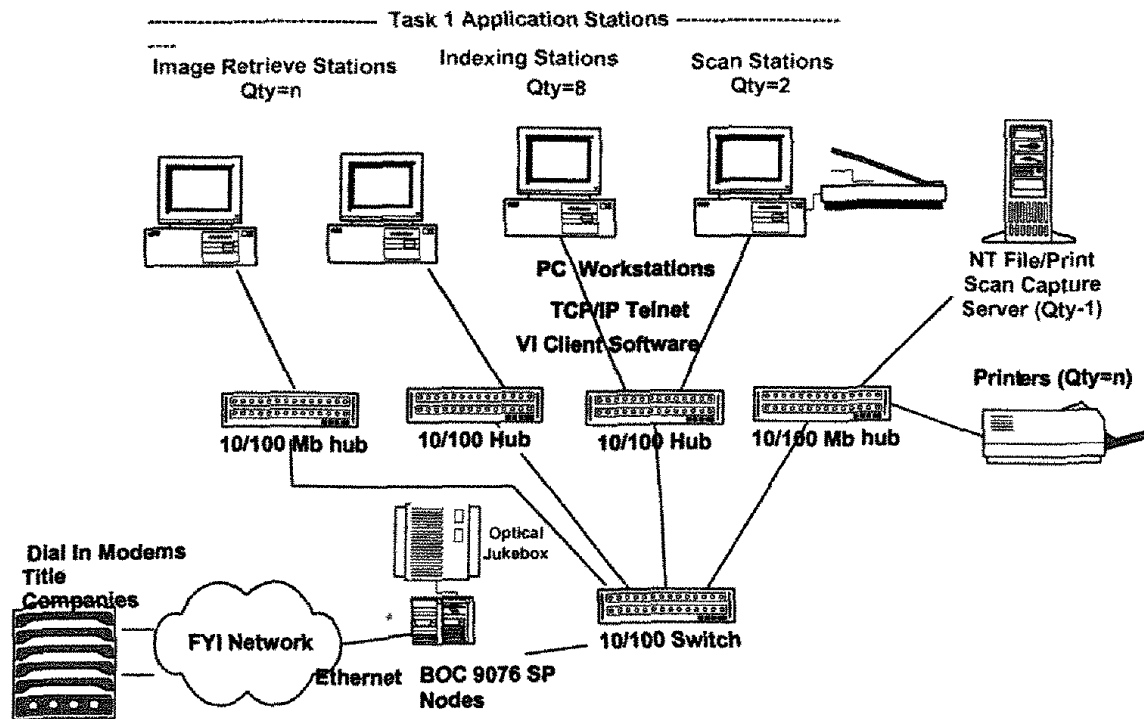
300521

3.1.5 Task 5 Proposed Solution

Task 5 – Implementing Imaging Capability to BCIS

In this task, the integration of images captured into the VisualInfo DB2 database will be integrated into the application, network and the operation of the BOC. This shall include the capabilities and requirements identified in Section 3.6 IMAGING REQUIREMENTS of the RFP. In addition, update functions will be created which will check that the links between the Text data and the Images are synchronized.

At this point, the BOC users will be able to pull up a record in either Regular or Land Court and be able to "hot key" up the associated document in another window on their PC. All the functionality provided on a standalone basis in task 4, will now be available to any BOC user. We will work with the BOC to determine how, and where this functionality is needed, both for local BOC users as well as the Neighbor Island BOC offices.

One example of data to image application linking is in the LCATS Encumbrance screen. While reviewing an encumbrance for a certain CT#, and with the cursor on the encumbrance record of interest, pressing a "hot key", say PF 17, will automatically retrieve the document associated with that encumbrance, and display it in another window on the users PC. The user will only have to click within the image window, to make it the active window, and use all the image navigation tools available under VisualInfo.

3.1.6 Task 6 Proposed Solution

Task 6 – Enabling Remote Access to Text Data

Overview

In this task, we will provide additional components for remote access to the BCIS text data for neighbor island BOC locations. This will allow any BOC user in the five remote locations, via a high speed data line to perform the same functions as if they were in the Honolulu office to text data, based on their logon security. The neighbor island users will connect via a cost/performance effective solution like Frame Relay or ISDN, with Frame Relay being preferred due to its scalability of speeds above 128Kb.

This task includes setup of the five remote locations to each be outfitted with a DELL PC 450MHz with 64MB SDRAM, 6.4GB of disk, and a 17" color monitor. Also, a Lexmark 12PPM Laser Printer will be attached so that remote printing would be possible at these neighbor island locations. The same equipment at the remote locations are also proposed for the Honolulu BOC, so that users will be familiar with the hardware operations. These same hardware components already exist in the State Parks Division. Connecting this hardware to the BCIS, will be additional network components consisting of Cisco Routers to support Frame Relay access.
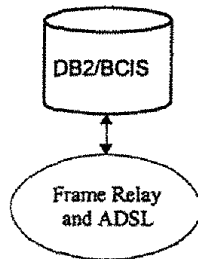
Neighbor Island Users
The Neighbor island users will utilize the BCIS application developed during task 3. The neighbor island users will connect via a cost/performance effective solution like Frame Relay, ADSL, or ISDN. Frame Relay is preferred due to its scalability in increasing line speeds over an initial 128Kb. Additionally, with the advent of ADSL and its higher speeds for image downloading, a combination frame relay/ADSL network is very feasible. ADSL is only available in certain locations, but it does coexist on the same central lines as frame relay, so the combination of two is a very viable solution. For each site, research on the availability of ADSL and frame relay will have to be reviewed and the most reliable cost effective solution chosen. Our design can easily accommodate this combination. The remote BOC will access the BCIS applications through the LAN/ WAN that will connect these users to the BOC RS/6000 SP node.

Access to retrieve the image component is planed for the next task. Here neighbor island users will access a partial BCIS application through the remote network. This remote access BCIS will have a sub-set of functionality to let users search and browse for information similar in function to the FYI users, including the ability to print a limited set of reports, such as CT's and other forms.

When approved and in place, there could be an optional capture screen that will gather the users credit card information to optionally charge for printed hard copies. There will be links in the FYI modules to allow for this when the BOC is ready to implement it. This would entail signing up with a clearinghouse vendor who will provide credit card authorization and validation electronically. This implementation is not planned for at this time, and not included in the proposal.

300523

Task 6 - Remote Access – Text Data

Task 6 Environment Description

Overview

The Task 6 Networking pieces will build on those already provided in Task 1, and entails adding additional remote access for BOC personnel on the Neighbor Islands.
The same base local high speed Ethernet remains intact.

Full remote BOC support for such locations as the Neighbor islands can be provided through public Frame Relay/ADSL or ISDN access, the state's Hawaiian network, or through the Internet using Extranet (VPN) technology. Given the requirement to support up to two PC's in each location, the combination frame relay and ADSL solution is being proposed. This would allow for a minimum of 128K circuits to each remote location, with image downloading at higher speeds being possible to ADSL locations. Additionally, the capability to add speed as needed will be there. The cost of a full T1 Frame Relay connection is about $600/month, while 128K is $200. ADSL costs range as low as $40/month for a 384K downstream circuit. For planning purposes, approximate image delay over a T1 is less than one second.

Configurations to support the frame relay alternative at ICSD would be an additional Router with an Ethernet connection to the BOC Switch. The remote sites will have PC's with Printers. The BOC's RS/6000 SP node will provide disk features that are necessary for the Databases.

Components

- Cisco 4500 Router for Outer Island access

- DSU's to connect remote connections to router

- Cisco 2505 Routers/hubs in each of the five remote locations

- ADSL locations will only require a 3COM 10 Mb Hub

- One PC and a printer in each of the five remote locations

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3.1.7 Task 7 Proposed Solution

Task 7 – Enable Remote Access to Image Data

Overview

This task provides additional access to the BCIS image data for Neighbor Island BOC locations. This will allow any BOC user in the five remote locations, via a high speed data line, to perform the same functions as if they were in the Honolulu office for both text data and now, images, based on their logon security.

PC software will have already been installed during Task 6 at the five remote locations, which will enable them to access the BCIS. Along with the software, 12ppm laser printers will already be available for both data and image printing.

The Neighbor island users will now be able to utilize the images developed in task 4 and made available to the local BOC users during task 5. The remote users will be able to retrieve document side-by-side from the Regular or LCATS text data or by using a standalone image query screen to pull up just a document, by document number. Optionally, a charge module using a credit cards scheme can be implemented so that the BOC can provide, and automatically collect fees for remote printing.

The same base local high speed Ethernet remains intact, along with all other components.

Task 7 - Remote Access to Images
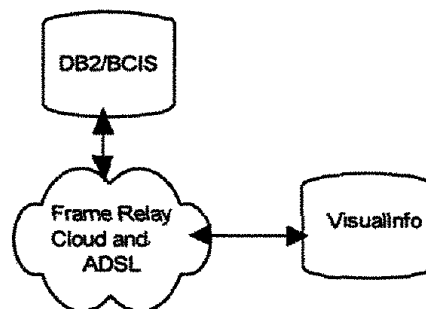
3.1.7 Task 7 b Proposed Solution

Task 7 b – Backfile Microfilm Integration

We intend to perform the integration of the images and data provided by the vendor chosen by the BOC to complete Part 2, Task 12 Load Back Microfilm Images at this step. We feel that this will give the BOC some time to implement procedures and understand the processes including stabilizing it's own image and data entry retrieval processes, before undertaking bulk loading of images. We will provide the chosen vendor with needed specifications in order to correctly integrate their images into the BCIS. We will also design procedures and provide a customized import program that can be used by the BOC in timely controlled updates to the BCIS with the images and data from the vendor.

The proposed conversion process / solution is comprised of two steps as described below:

(1) Media transfer of Microfilm Conversion images and data onto the BCIS
(2) Store (Import) to VisualInfo

(1) Media transfer of converted images and data

The purpose of this step will be to load the magnetic media of converted microfilm images and data to a secure disk in the VisualInfo environment. We will work with the Part II vendor to provide specifications for image and data storage and will setup and help the BOC with procedures to accomplish loading of the raw data. This process will be a batch process, and operate independently of the BOC imaging system, so as to not interfere with the implementation and daily operation of the imaging system.

(2) Store (Import) to VisualInfo

The purpose of this step will be to take the images and indexing from the conversion process described above and import (store) the documents into VisualInfo. The documents will be automatically indexed using the data provided along with the image from the vendor. Once the images are stored into VisualInfo they will available for retrieval side-by-side newly scanned documents. This will allow users to retrieve these bulk loaded images, just as if they were newly scanned documents, as they come into the system.

Orphan Image Update of BCIS Application

We will develop an Update function that will check that links from Land Court and Regular System DB2 VisualInfo database to synchronize the data and images environments. This is to verify that the DB2 links to the images exists, for all images that are scanned, to facilitate timely image retrieval.

300526

3.1.8 Task 8 Proposed Solution

Task 8 – Enable Public Access to Text Data

Overview

For Task 8, we will provide additional components for Internet public access. First off, will be access to BCIS Text Data utilizing a web enabled java application to meet their requirements while maintaining adequate security.

In this task, we will provide additional components for Internet access to the BCIS text data for the General Public utilizing a PC containing a common web browser (like Microsoft Internet Explorer or Netscape Navigator). During this task two additional servers, the Public Access web server and a separate firewall, will be added to the rack installed already installed in task 1. The firewall will provide secure only access to the BCIS for the public. We will also interfacing the Web Server and the Firewall to the Internet using a Cisco Router connected to ICSD's Internet connection connected to ICSD's Internet connection

A Public Access Web Server, accessing the back end BCIS applications via DB2 Queries, and IBM ContentConnect's Web based image retrieval system, will contain the web enabled java application which will drive the end user search and retrieval of text data. We will provide the java based application which the BOC web page will link to.

The proposed Internet public access solution is divided into two areas: (1) data retrieval and (2) image retrieval. This task will enable data retrieval while task 9 will provide image retrieval for Public Access.

For the data retrieval component, public users will access a partial BCIS application through the Internet. This will be referred to as the Web-based BCIS for clarification purpose. This Web-based BCIS will have a limited set of functionality to let users search and browse for information but this will not be a full replication of BCIS on the Web. The process will consist of initial user access to the BCIS application, via a customized Java applet. The web-based Hawaii FYI Java application will provide increased functionality over the current Land Court FYI and be enhanced to provide better search and print capabilities. This new module will also provide access to the Regular System. We will perform analysis of the existing Hawaii FYI system to determine the enhancements required prior to developing the final product. It will also include an analysis of an accounting module to enable the BOC to charge for printing by the page of image documents or as is currently handled, unlimited printing for subscription users.

The IBM ContentConnect product allows access to VisualInfo to be performed on any client operating system using a standard WEB browser with Java runtime.

Task 8 Environment Description

The Task 9 Networking pieces will build on those already provided in Task 1. Internet Public Access will be provided through a Windows NT based Web Server connected to a public Ethernet. This public access Ethernet will be isolated from the remainder of the BOC network by a Firewall. The application on this node will be web/java enabled, and will gain

300527

access to pertinent data on the BOC nodes through SQL queries, which will be restricted on the Firewall. This will provide sufficient security to protect the production data.

The Firewall will be an NT based machine, with Firewall software. The machine will have three Ethernet adapters. One adapter will connect to the BOC NT LAN Ethernet, one to the Internet, and one to a "demilitarized zone" (DMZ). The Public Access node will connect to this DMZ Ethernet. Connection to the Internet will be made through a Router connected to ICSD's Internet service. Connection can be via a direct Ethernet connection, or a simulated T1 to the Basement. The Router connects to the third Ethernet card on the Firewall. The public will connect via this router to the firewall, which will redirect traffic only to the public access node. Web enabled applications on the Public Access Node will provide information to the public, and will request data from the BOC nodes via SQL requests. Only these SQL requests will be allowed through the Firewall into the production BOC nodes.

Windows NT is recommended for both the Firewall and the Web Server. The BOC Data Base will remain on the RS/6000 SP node, but these front-end NT servers will effectively isolate the BCIS database.

Components

- 450 MHz PC for Firewall, with 128 Mb RAM, 4.5 GB Hard Drive, 3 Ethernet cards, and Windows NT
- Firewall software
- Cisco 2500 Router for Internet access
- DSU for Internet access

300528

3.1.9 Task 9 Proposed Solution

Task 9 – Enable Public Access to Image Data

Overview

This task utilizes the same components installed in task 8 and in addition provides for additional access to the BCIS image data over the Internet for Public Access. Anyone accessing the BCIS over the Internet with a PC containing a common web browser (like Microsoft Internet Explorer or Netscape Navigator) will be able to access both text and image data from the BCIS. There are no additional hardware or software components that are needed here.

For the image retrieval component, the user will have the option of entering the imaging system from the BCIS Java application to retrieve the specific document. For this web-based image retrieve function, the IBM ContentConnect java client will make a request for an image that is passed through the Web Server which in turn communicates with the VisualInfo Library and Object Server. For the public access information flow, please refer to the following diagram:

Task 9 - Remote Access
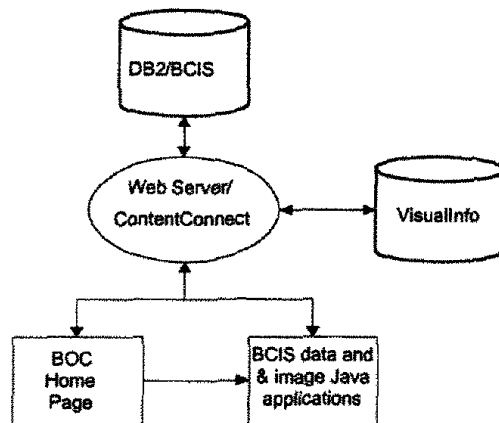
The IBM ContentConnect product allows access to VisualInfo to be performed on any client operating system using a standard WEB browser with Java runtime.

3.1.10 Task 10 Proposed Solution

Task 10 – Data Remediation

Back file conversion of General Index data contained on the ICSD mainframe since 1976 will be converted and imported into the new BCIS, and therefore be available to authorized users and the new General Index search module. We will work with ICSD in obtaining magnetic tape or other compatible electronic media to accomplish this. The records provided will be scanned for missing fields and an exception report of these records will be provided. Alternatively, if the Part II, Task 12 vendor provides this information as part of their submittals along with the 10 years of microfilm to image conversion, we will provide the import program to read their information and update the BCIS accordingly.

Depending on the condition of the data being stored on the mainframe as well as it's completeness, we will attempt to correct known abnormalities in order to import as many records as can be done, without compromising the data integrity of the new BCIS database. If the Task 12 vendor provides more correct and complete data, then we will use this data for the period provided.

System Information:

Magnetic information can be provided both by magnetic tape and electronic downloads from the mainframe. Data from earlier years are not complete, and may be missing for a few periods. Data is contained on both disk and archive file storage (ie. not on-line). ICSD will be depended upon to provide information on suitable media or help with electronic transfers, which ever allows for feasible faster throughput to the BCIS. Upon review of mainframe data contained, the BOC can decide whether or not to include the data in the new BCIS. Estimates of General Index information on disk from 1976 contained on the mainframe are:

Go Forward Disk Estimates:	Average records/year	1998 Est records
Master File (Regular System)	700,000	600,000
Master File (Land Court)	350,000	250,000
Based on 1998 record counts		850,000
Total disk space required per year		300 MB per year

Back Data File Current Storage needs:

History – from 1990 forward are contained on disk (on-line)
Archive – from 1976 – 1989 are contained on the shelf (off-line)

1973 – 1988	15 years (est.)	3,750 MB
1989 – 1993	10 years (est.)	1,250 MB
1994 – current	6 years (est.)	1,250 MB
		6,500 MB Total on mainframe

3.1.11 Task 11 Proposed Solution

Task 11 – GIS Requirements Study

This task involves the formulation of a proposal based upon the needs of the BOC to store or access GIS map data (plat maps). This involves presentation and submission of a written report that is clearly understood to the BOC. Basically this entails conducting a study toward later implementation. This does not involve submitting an actual plan or cost estimates for a functional GIS system, but rather to define "System Requirements" and present "System Design Alternatives" (physical design which indicates task for each alternative that should be considered).

Here, with the help of a GIS Analyst, we will conduct a needs assessment for the development of an automated mapping program for the BOC. The approach for conducting this study will involve the potential managers and end users of the recommended solution. Once the current system is understood, a Needs Assessment report will be prepared which will define the requirements of the system. Using this report, an Implementation Plan will be prepared that will provide the most cost effective and functional solution to the BOC.

We have obtained five general Work Plans and Pricing from GIS specialist here in Hawaii who were each provided with an overall idea of what this task involved. Each consultant has the necessary skills to provide a study, Request for Quotation, and implement a suitable GIS system. Our findings concluded that the overall price for the initial study would generally be the same, but each consultant had a different approach and work plan. Therefore, we would like to approach this task with an overall needs assessment with the BOC first, and based on these requirements, select the appropriate consultant who can perform a feasible study with deliverables within our cost estimates. These consultants are:

Shannon McElvaney　　　　　　　　　　　　Allan Cadieux
Geo InSight International, Inc.　　　　　　　Carter & Burgess
Located in Manoa　　　　　　　　　　　　　Located in Downtown Honolulu

Sherry Amundson　　　　　　　　　　　　　Dave Bramwell
Maptech, Inc.　　　　　　　　　　　　　　　Integrated Information Solutions
Located in Hilo　　　　　　　　　　　　　　Located in Kailua, Oahu

Royce Jones
GDSI Hawaii
Located in Manoa

3.1.12 Task 12 Proposed Solution

Task 12 – Load Back Microfilm Images

The Lange Group has declined to provide services for Part 2, Task 12 Load Back Microfilm Images, but has included services to work with the appropriate vendor of choice in planning,

and implementation of their images import. Theses services are further described in Task 7b, Backfile Microfilm Integration.

3.2 Work Plan

This section defines the scope of work to be accomplished by The Lange Group under the terms and conditions of the Contract between the State of Hawaii and The Lange Group (Agreement). The tasks to be performed are listed and an estimated schedule is provided. In addition the responsibilities of the BOC are listed.

Changes to this Statement of Work will be processed in accordance with the procedure described in section 3.5 Project Change Control Procedure. The investigation and the implementation of changes may result in modifications to the Estimated Schedule, Charges, and/or other terms of the Agreement.

Section 6.0 Pricing is incorporated in and made a part of this Statement of Work.

3.2.1 Project Scope

The purpose of this project is to implement Bureau of Conveyance Integrated System (BCIS) which consists of services to migrate the existing WANG applications, design and develop enhancements, design and develop a new Regular System Automated Tracking, conversion of WANG data to the new BCIS, Image enablement, and provide Neighbor Island and Internet access to both recording systems

The Bureau of Conveyances has organized the BCIS project into two parts and twelve tasks of which this Statement of Work covers eleven of the twelve tasks, known as Part 1. The Lange Group has declined to include services for task 12, known as Part 2.

PART 1
    Phase 1
- Task 1 - Implement a Basic BOC Network
- Task 2 - BCIS Requirements Verification
- Task 3 – Replacement of the Regular and Land Court Systems

    Phase 2
- Task 4 – Implementing Imaging Capability on the BOC Network
- Task 5 – Implementing Imaging Capability to BCIS

    Phase 3
- Task 6 – Enabling Remote Access to Text Data
- Task 7 – Enable emote Access to Image Data
- Task 7 b – Backfile Microfilm Integration

    Phase 4
- Task 8 – Enable Public Access to Text Data
- Task 9 – Enable Public Aces to Image Data

    Phase 5
- Task 10 – Data Remediation

    Phase 6
- Task 11 – GIS Requirements Study

The Lange Group proposes consulting and implementation services for the migration of the (K06) LCATS and (K03) Receiving/Accounting applications to the BCIS, IBM RS/6000 SP environment, including conversion of existing data to the DB2 relational database. Also, our services will include the design, development, implementation and training of a new Regular System Automated Tracking module. The Lange Group will provide the BOC a fully functional Imaging system of recorded documents, which will capture General Indexing information, and link these documents images to the BCIS text data. There will be two forms of remote access to the BCIS. Neighbor Island access will be provided via Frame Relay or ISDN. For General Public access, we will provide a new Hawaii FYI module which can be accessed across the Internet via a browser. Lastly, we will provide GIS analysis and conduct a study of map data information handling at the BOC.

This Statement of Work (SOW) consists of the following major tasks and activities:

- Project Management

- Replacement of Regular System and General Indexes

- Conversion of General Index files from mainframe

- Enhancement to Land Court and Regular System

- Image Enablement of Land Court and Regular System

- Neighbor Island and Internet Access

The scope of The Lange Group's participation in each of these tasks is as follows:

Task 1 - Implement a Basic BOC Network

We will provide consulting, implementation and training services to provide a working BOC network "LAN" at Kalanimoku. This includes:

- An NT based file and print server that will eventually serve as the Image capture server
- 33 each - Pentium III PC's with Windows 95/98 and software to access the BCIS, including six laser printers
- A fast ethernet based LAN
- Fiber and Category 5 copper cabling in support of this LAN

Task 2 - BCIS Requirements Verification

We will provide consulting services to assess the current environment, identify the system requirements, define objectives, and verify that the proposed BCIS meets the operational requirements of the BOC. It will include a structured walk through of specific tasks identified by the BOC, perform a functional comparison of the BCIS with the existing LCATS and

General Index systems, and perform a data flow analysis of the BCIS to insure that all data paths are addressed.

Task 3 – Replacement of the Regular and Land Court Systems

We will provide consulting, design, implementation and training services to provide the BOC with the new BCIS. This includes the migration from the Wang platform to the RS/6000 SP environment, and the conversion of 100% of the data contained on the Wang to a relational database, IBM's DB2. The BCIS will also include:

- 2 each (Primary and Production Nodes) - IBM RS/6000 SP nodes

- Connectivity to existing remote FYI (Title Company) users

- ADSM as a backup strategy

Task 4 – Implementing Imaging Capability on the BOC Network

We will provide consulting and implementation services for the implementation of a VisualInfo and Kofax solution. The services will include installation of the VisualInfo system hardware and software, tailoring of the VisualInfo software parameters, installation of Kofax software and hardware, customization of both Kofax and VisualInfo and user and system administrator training.

Task 5 – Implementing Imaging Capability to BCIS

In this task we will image enable the BCIS with the imaged documents scanned in during task 4. This would include a hot key in LCATS and Regular System to link and automatically pull up the actual document that the text data is displaying, but in another window.

Task 6 – Enabling Remote Access to Text Data

We will provide consulting and implementation services for the extension of the BCIS to BOC's Neighbor Island locations, for retrieving text data.

Task 7 – Enable Remote Access to Image Data

We will provide consulting and implementation services for the implementation of solution for retrieving images from the BCIS system by Neighbor Islands.

Task 7 b – Backfile Microfilm Integration

We will provide an automated utility and documentation to bulk import converted microfilm images into the VisualInfo imaging environment. The converted images will then be available for retrieval by BCIS users just as newly scanned documents.

Task 8 – Enable Public Access to Text Data

We will provide consulting and implementation services for the implementation of a web-based solution for retrieving text data from the BCIS system via the Internet. The services will include installation of the web-server hardware and software, installation and customization of IBM's ContentConnect Java based client application for VisualInfo and consulting services for developing a Java based application to access the DB2 BCIS database.

Task 9 – Enable Public Aces to Image Data

We will provide consulting and implementation services for the implementation of a web-based solution for retrieving document images from the BCIS system via the Internet.

Task 10 – Data Remediation

We will help in the conversion and integration of historical and archival data from 1976 currently stored on the mainframe at ICSD, into the BCIS.

Task 11 – GIS Requirements Study

We will conduct a study to analyze and recommend alternatives to the BOC that will address its GIS requirements.

3.2.2 Key Assumptions

This Statement of Work is predicated on the following assumptions and dependencies. These are based on our understanding of the requirements and design that have been developed jointly by BOC and The Lange Group. Any impact resulting from deviations to these assumptions will be assessed using the Project Change Control Procedure (section 3.5).

General

1. Development work under this Statement of Work will be performed at the BOC location in Honolulu, Hawaii, The Lange Group location in Honolulu, Hawaii, IBM in Honolulu, Hawaii and IBM Global Services location in Sacramento, California.

2. All deliverables will be provided on paper and electronically using MS Office products, and Visio software.

3. BOC will have five (5) business days to review each deliverable document for which BOC has approval responsibility. Rejections must be for cause and in writing within the five (5) day period.

4. The Lange Group may use subcontractors to perform a portion of the proposed work.

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5. In order to help reduce the potential for cost and schedule overruns, The Lange Group and BOC agree to minimize time spent in meetings.

6. All hardware, software and network components necessary to perform each task, will have been procured and installed prior to the commencement of each task, including workstations and printers.

7. We are not providing any Year 2000 services under this Statement of Work, but all software derived by The Lange Group specify the Year 2000 readiness. We do not make any representations regarding the Year 2000 readiness of any other vendors product.

8. The Lange Group and BOC agree not to directly or indirectly induce or solicit for employment any employee of the other who directly performs work on this project, from the execution date of this Agreement, to one year after the completion, termination or expiration date of this Agreement, whichever comes first. For purposes of this document, The Lange Group includes any successor organization and BOC means BOC and any successor organization.

9. The development of a training plan and the provision of in-depth product training, which will include, but is not limited to ADSM, DB2, RS/6000, AIX, TCP/IP, VisualInfo, ImagePlus VisualInfo and Kofax, to the appropriate BOC staff or their subcontractors is the responsibility of BOC.

10. We have sized and will configure the DB2/6000 environment to support the volumes documented in the "System Information" section of the Statement of Work within this RFP response. Such sizing was estimated based on current volumes known within the current BOC Wang environment.

11. BOC will provide use of a WANG VS to contain migration data and use of already in place Wang data transfer environments to facilitate Wang to PC data conversion step. This may include the use of Wang to PC gateways (Lightspeed) or and WANG PC/LIS software

12. BOC will authorize ICSD to provide on magnetic media, the General Index files currently contained on the mainframe in a suitable format to be converted to the BCIS database

13. BOC will identify one Operations Support person, and one Technical Support person to assist in the implementation and testing, and will receive knowledge of the system through skills transfer training. This person is expected to assist The Lange Group in all tasks and to be knowledgeable in all aspects of the project

14. BOC will identify one key person who will be responsible in making final decisions when necessary, known as the "responsible person". This person is expected to assist The Lange Group in all tasks and to be knowledgeable in all aspects of the project

15. During this project, the testing environment located at the BOC location will become the development environment. Therefore, one environment will be used for testing and development

16. The users of the VisualInfo solution will be familiar with personal computer and Windows functions.

17. One BOC operations person, and one BOC Technical Support person will assist in the implementation and testing of the VisualInfo hardware and software and will receive knowledge of the system through skills transfer training.

18. Converted microfilm images and indices will be provided by the BOC in an agreed upon format consistant with the BCIS Imaging system.

19. This SOW does not address the capturing of image retrieval statistics to bill public users.

3.2.3 The Lange Group Responsibilities

The tasks to be performed by The Lange Group are listed below and will be performed by The Lange Group or personnel subcontracted by The Lange Group.

3.2.3.1 Project Management

Description: The objective of this activity is to provide technical direction and control of all members of this project and to provide a framework for project, communications, reporting, and procedural and contractual activity. The tasks are as follows:

- Prepare a high-level Project Plan for performance of this Statement of Work that defines the tasks and schedule responsibilities.

- Maintain project communications through the BOC Project Manager.

- Assist the BOC Project Manager in establishing documentation and procedural standards for the project.

- Assist the BOC Project Manager in maintaining a Project Plan, which defines the detailed tasks, completion schedule, and task responsibilities.

- Provide weekly status reports when The Lange Group resources are actively engaged.

- Review and administer, as appropriate, the Project Change Control Procedure (3.5) with the BOC Project Manager.

- Coordinate and manage the technical activities of the project personnel.

Completion Criteria:

Upon completion of all Phases of this project

Deliverables:

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- Periodic Status Reports

- Initial Project Plan

Task 1 - Implement a Basic BOC Network

3.2.3.2   Network Design Validation

Description: The objective of this activity is to validate the network requirements and develop a detailed design. The following tasks will be performed in this activity:

- Perform up to four interviews to refine and validate the network design.
- Research current available technology to develop the detailed design.
- Develop the Network Design Document.
- Identify any new hardware and software required.
- Develop the IP addressing scheme for the BOC.

Completion Criteria: This activity will be considered complete when the Network Design Document has been delivered to BOC Project Manager.

Deliverables:

- Network Design Document.

3.2.3.3   Installation of Network Components

Description: The objective of this activity is to create a working network in support of the BCIS and imaging applications. Network components will include Ethernet switches and hubs, PC's, and a Windows NT Server.

- Physically install and configure the network components recommended in the Network Design Document. These include:
  - 1 - 24 port 10/100 Ethernet switch, with redundant power supply
  - 2 - 24 port 100 Ethernet hubs with management modules
  - 2 - 24 port 10/100 Ethernet hubs with management modules.
- Physically install and configure other network components provided by BOC. These include:
  - all PC's, with Windows 95/98, Telnet software
  - network attached printers
  - 1 - Windows NT 4.0 File and Print Server
- Test connectivity between the PC workstations and the NT File Server.
- Document the configuration of the switches, the PC's, and the NT File Server.
- Provide up to one day of training for up to 10 BOC personnel in the operation of the new PC workstations.

- Provide up to one day of training for two BOC personnel on the operation of the Windows NT server and the switches/hubs.

Completion Criteria: This activity will be considered complete when all components have been installed and configured, documentation has been provided, and training completed.

Deliverables: None

3.2.3.4   Installation of Cabling

Description: The objective of this activity is to install the fiber optic and copper cabling to support the BCIS Network Connectivity.

- Install FutureFlex Air Blown Fiber tube cable between the ICSD computer room and each of two (2) BOC's first floor cabinet locations. A six-strand multimode fiber optic cable will be installed in each tube cable.
- Install two (2) 36-inch lockable equipment cabinets with fans in the BOC to function as IDFs, and a 19" x 84" equipment rack to function as the MDF.
- Terminate all fibers in three (3) fiber termination panels, OTDR and insertion loss test at 850/1300 nanometers, and provide written and graphical test results.
- Install eighty (80) single Category-5 cable outlets in rooms 121, 122 and 123; and one (1) cable outlet in the ICSD computer room. Test all outlets for Category-5 compliance at 100 MHz.

Completion Criteria: This activity will be considered complete when the cabling has been installed and tested.

Deliverables: None

Task 2 - BCIS Requirements Verification

Task Description: The objective of this activity is to assist the BOC in evaluating the existing environment, work with BOC staff in needs assessment and provide comparisons. Facilitate meetings with the BOC to validate that the design of the BCIS will meet their needs. Perform a structured walk through of specific tasks identified by the BOC. Perform a functional comparison of the BCIS with the existing LCATS and General Index systems. Perform a data flow analysis of BCIS that will confirm that all data paths are addressed.

Completion Criteria

This task is complete when the Requirements Document has been submitted to BOC.

Deliverables

- Requirements Document

Task 3 – Replacement of the Regular and Land Court Systems

3.2.3.5   RS/6000 SP BOC Node Planning

Description: The objective of this activity is to review and plan the installation of the RS/6000 SP nodes and the associated software. The following tasks will be performed in this activity:

- Prepare and conduct one planning meeting
- Document hardware layout and physical disk configurations
- Review and document RS/6000 SP node Installation plan
- Review and document software configurations, including IP addressing.

Completion Criteria: This activity will be considered complete when the planning meeting has been conducted, and the RS/6000 SP node Installation plan has been delivered.

Deliverables:

- RS/6000 SP node Installation plan

3.2.3.6   Installation of RS/6000 SP Silver Nodes and Associated Software

Description: The purpose of this activity is to install the RS/6000 SP nodes, capable of operating on the network, supporting the BCIS Application, and ready for the Image application to be added. The following tasks are included in this activity:

- Perform physical planning for the RS/6000 SP node to verify space availability, and electrical requirements.
- Provide physical requirements to BOC personnel for ordering.
- Schedule CE to install the RS/6000 SP nodes
- Prepare the basic software, including:
  - Install the AIX Operating System
  - Install appropriate Y2K and Operating System Patches
  - Set up private IP address
  - Install appropriate device/kernel drivers Start carving the hard disks
- Load ADSM LPP and client code
- Customize ADSM using default management classes
- Customize and setup disk, tape, and copy pools
- Set up mirror protection for ADSM data base
- Install and setup DB2/6000
- Provide one half day training on the RS/6000 SP nodes and associated software operation for two BOC personnel.
- Provide documented control book showing the RS/6000 SP nodes and software configurations.

Completion Criteria: This activity will be complete when the RS/6000 nodes and associated software are installed and operational, and the Control Book has been delivered

Deliverables:

- RS/6000 Control Book.

3.2.3.7 Perform Migration to the BCIS from the WANG environment

Task Description: The objective of this activity is to convert all programs and data that currently reside on the WANG VS computer system in the applications known as K03 and K06, to the BCIS. This task is dependent on required hardware, software and networking components being in place.

- Review with client work plan associated with this task including estimated schedules and obtain client approval
- Obtain current SPEED II application software K03, K06 from BOC
- Obtain current WANG Master data files for K03, K06 from the BOC

All work from this point is done in the WANG development region

- Setup, and populate the application and data files from BOC
- Create the export K03 & K06 application
- Create the export K03 & K06 data
- Determine the PC transferring workstations and insure proper hookups to the WANG and the BCIS
- Create migration check point sheets, used in tracking and establishing benchmarks
- Transfer (download, upload) the application export files from the WANG to the PC then to the BCIS
- Transfer (download, upload) the data export files in the same manner

All work from this point down is done on the BCIS

- Perform validation checks of the import files
- Setup the APPX development region for the K03 & K06 application and data
- Import the application files into APPX development region
- Import the data files into APPX development region
- Perform conformity verification and corrections on all menus, jobs and functions in the application software to match the WANG, including data verification
- Setup and populate the test regions for application and data
- Create the DB2 Update program that will read the test data and write the DB2 test database

Initial Testing of K03, K06 application in Prototype Region

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- Prepare training materials
- Develop Initial Test Cases
- Train BOC staff
- Assist BOC with initial testing period

DB2 setup and interface

- Verify that DB2 is working properly
- Define authority privileges and test assignments for dba, developers and users
- Setup the DB2 test data environment same as the migration test environment
- Run the DB2 Update program to populate the DB2 test database
- Perform verification checks on the data and verify the application links to it correctly
- Verify that the application and DB2 test environment performs correctly
- Setup the DB2 production environment
- Develop Acceptance Test Cases

Testing Period to run from 1 – 3 months

- Migrate the full WANG data to DB2, using this for benchmark throughput times
- Assist and test ADSM backup and recovery procedures
- Assist with test of Hawaii FYI connections
- Create Hawaii FYI User Instructions
- Identify and prepare migration environment on the BOC WANG VS2
- Perform parallel acceptance testing by BOC

Cutover from the WANG to the BCIS

- Review with BOC and ICSD testing status and plan cutover dates, plan for follow-up activities such as advisory notices to Hawaii FYI subscribers
- Perform final migration of the full WANG data to DB2

Completion Criteria:

This task will be completed when all milestones have been completed. The following milestones are defined in this task:

Milestone 1:   After satisfactory completion of Initial Testing in the Prototype Region
Milestone 2:   After satisfactory completion of Acceptance Testing by BOC
Milestone 3:   Ten business days after final migration and cutover to the BCIS

Deliverables:

- Migrated APPX application (K03) LCATS/FYI and (K06) Receiving/Accounting
- Converted Data from WANG DMS to IBM DB2
- Acceptance Test Cases
- Hawaii FYI User Instructions
- APPX Application and User Manuals

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3.2.3.8 Create new Regular System Automated Tracking and General Index

Task Description: The objective of this activity is to design, develop and implement a Regular System Automated Tracking and General Index replacement system. This task will overlap with 3.2.3.7 Perform Migration to the BCIS. This task is dependent on required hardware, software and networking components being in place.

- Facilitate up to two four-hour workflow sessions
- Facilitate up to two two-hour meetings with Companies who receive magnetic tapes
- Develop the Detail Design
- Facilitate up to two four-hour design reviews
- Develop the Prototype
- Facilitate up to two four-hour Prototype reviews
- Develop the Software
- Develop Acceptance Test cases
- Create Download Company Instructions
- Develop Training materials

Initial Testing
- Train BOC staff
- Assist BOC with initial testing period
- Assist with download testing

Implementation and Solution Validation
- Initialize Production environment
- Assist with Acceptance Test

Completion Criteria: This task will be complete after the first ten business days of production.

Deliverables:

- New (Kxx) Regular System Automated Tracking and General Indexes
- Design Document
- Acceptance Test Cases
- Training Materials

3.2.3.9 Enhance the Land Court and Regular System

Task Description: The objective of this activity is to re-engineer the workflow and enhance the Land Court and Regular Systems. Bar coded labels will be introduced. This task will overlap with task 3.2.3.7 Perform Migration to the BCIS. This task is dependent on required hardware, software and networking components being in place.

- Facilitate up to two four-hour design sessions

- Make software changes in test region
- Facilitate one four-hour prototype review session

Implementation and Solution Validation

- Move software into production environment

Completion Criteria: This task will be complete after the first ten business days after production.

Deliverables:

- Modified K03, K06, Kxx software
- Modifications Made Document

Task 4 – Implementing Imaging Capability on the BOC Network

3.2.3.10 Solution Definition

Description: The objective of the Solution Definition activity is to determine and solidify the requirements for the BCIS imaging implementation. The following tasks will be performed in this activity:

- Facilitate up to two, four-hour image workflow sessions which include the following tasks:

  - Define rules and edits required during the index process; and
  - Define document types and exception processing.

These sessions will lead to the customization of the Kofax and VisualInfo software.

- Facilitate up to two, four-hour configuration definition and infrastructure validation sessions.
- Confirm the infrastructure requirements for the production environment. Confirm hardware and software sizing and configurations. Specific topics will include performance, availability, backup/recovery and leveraging of existing infrastructure (i.e. DNS, tape backup).
- Develop the System Requirements Specification document.

Completion Criteria: This activity will be considered complete when the System Requirements Specification has been delivered

Deliverables:

- System Requirements Specification

3.2.3.11 Develop Test Plans

Description: The development of the System Test Cases and Acceptance Test Plan will occur during this activity. The following tasks are included in this activity:

- Develop System Test Cases
- Develop Acceptance Test Plan

Assistance on the following tasks will be provided:

- BOC will assist in the development of the Acceptance Test Plan

Completion Criteria: This activity will be complete when the Acceptance Test Plan has been delivered

Deliverable Materials:

- Acceptance Test Plan

3.2.3.12 Solution Generation

Description: The purpose of this activity is to install and configure necessary hardware and software components for the imaging solution. Also included will be the customization tasks necessary for the imaging solution. Installation and configuration will consist of:

- Configure Kofax Sub System Server (1)
- Configure Kofax Index workstations (2)
- Configure Scan workstations (2)
- Configure Kofax Ascent Capture software
- Configure IBM 3995 Optical Library (1)
- Install VisualInfo Library Server (1)
- Configure VisualInfo Library Server software and prerequisite software, including DB2 and ADSM
- Install VisualInfo Object Server (1)
- Configure VisualInfo Object Server software and prerequisite software, including DB2 and ADSM
- Configure VisualInfo Client workstations
- Install Microfilm Generator

For the customization portion of this activity, the following tasks will be performed:
- Customization of the Kofax Index software
- Customization of the Microfilm Generator

Finally, integration tests will be performed to ensure all components are working together.

Completion Criteria: This activity will be complete when all Kofax and VisualInfo components are installed and configured.

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Deliverable Materials: None.

3.2.3.13 Solution Validation

Description: During this activity, The Lange Group will perform the System Test and will provide up to 40 hours of assistance to BOC with the Acceptance Test.

- Perform System Test
- Assist with Acceptance Test

The BOC will be responsible for:

- Perform Acceptance Test

Completion Criteria: This activity will be complete when the Acceptance Test executes as outlined in the Acceptance Test Plan.

Deliverable Materials: None

3.2.3.14 Procedures and Training

Description: The purpose of this activity is to plan and conduct the training for the BCIS imaging system. The following tasks will be performed:

- Develop training materials
- Conduct Training on VisualInfo Security / System Administration for up to 2 users
- Conduct Training on Kofax Scan Subsystem for up to 5 users
- Conduct Train the Trainer session for the Retrieval Users for up to 5 users

Completion Criteria:

This task will be complete when The Lange Group has conducted the half-day Security training, the half-day System Administration training, the half-day Scan Subsystem training and the half-day Train the Trainer session for Retrieve.

Deliverable Materials: Training Materials

Task 5 – Implementing Imaging Capability to BCIS

The objective of this activity is to image enable the Land Court and Regular System with the images scanned in during task 4.

3.2.3.15 Solution Definition

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Description: The objective of the Solution Definition activity is to determine and solidify the requirements for the imaging implementation to interface to BCIS. The following tasks will be performed in this activity:

- Facilitate one four-hour image session which includes the following tasks:
    - Define interface requirements to DB2 BCIS database
    - Define annotation requirements
    - Define retrieval requirements from BCIS application
    - Prepare the BCIS Interface Specification

Completion Criteria: This activity will be considered complete when the BCIS Interface Specification has been delivered

Deliverables:

- BCIS Interface Specification

- Modified K03, Kxx software

3.2.3.16 Develop Test Plans

Description: The development of the System Test Cases and Acceptance Test Plan will occur during this activity. The following tasks are included in this activity:

- Develop System Test Cases
- Develop Acceptance Test Plan

Assistance on the following tasks will be provided:

- BOC will assist in the development of the Acceptance Test Plan

Completion Criteria: This activity will be complete when the Acceptance Test Plan has been delivered to BOC Project Manager.

Deliverable Materials: Acceptance Test Plan

3.2.3.17 Solution Generation

Description: The purpose of this activity is customize the imaging software to integrate to the BCIS application. Customization will consist of:

- Customization of the Kofax Release module to integrate with the DB2 BCIS application
- Customization to include annotations for the image for page numbers
- Customized retrieve module for the BCIS application.

Finally, integration tests will be performed to ensure all components are working together.

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Completion Criteria: This activity will be complete when the above components have been customized according to the BCIS Interface Specification.

Deliverable Materials: None.

3.2.3.18 Procedures and Training

Description: The purpose of this activity is to plan and conduct the training for the BCIS imaging system.   The following tasks will be performed:

- Develop training materials
- Conduct System Administration training for up to 2 users
- Conduct Train the Trainer session for the Retrieval Users for up to 5 users

Completion Criteria:

This task will be complete when The Lange Group has conducted the 1 hour System Administration training and the 2 hour train the trainer session.

Deliverable Materials: Training Materials

Task 6 – Enabling Remote Access to Text Data

3.2.3.19 Design/Install Remote Access

Description: The objective of this task is to deploy a remote access solution for BOC locations on the neighbor islands.   The following tasks will be performed as part of this activity:

- Define the remote access requirements and validate the existing design
- Install and configure hardware necessary for this support to include:
  - One Cisco 4500 Router at ICSD for remote frame relay connections
  - Five Cisco 2500 Routers on the neighbor islands
  - Five PC's for access to the BCIS system
  - Test connectivity from the remote PC's to the BCIS text data
  - Document configurations of routers in the Router Configuration Document
  - Update the Network Design document with the new configuration

Completion Criteria: This activity will be complete when the neighbor island PC's can connect to the BCIS data and the configuration documents have been delivered.

Deliverables:

- Updated Network Design Document
- Router Configuration document

3.2.3.20 Solution Definition

Description: The objective of the Solution Definition activity is to determine and solidify the requirements for the remote access to the BCIS text data

- Facilitate up to one, four-hour configuration definition and infrastructure validation session.
- Confirm the infrastructure requirements for the remote environments. Confirm hardware and software sizing and configurations.
- Update the System Requirements Specification document.

Completion Criteria: This activity will be considered complete when the System Requirements Specification has been updated and delivered

Deliverables: Updated System Requirements Specification

3.2.3.21 Develop Test Plans

Description: The development of the System Test Cases and Acceptance Test Plan will occur during this activity. The following tasks are included in this activity:

- Develop System Test Cases
- Develop Acceptance Test Plan
-

Completion Criteria: This activity will be complete when the Acceptance Test Plan has been delivered

Deliverable Materials: Acceptance Test Plan

3.2.3.22 Solution Generation

Description: The purpose of this activity is to install and configure necessary hardware and software components for the remote access to the imaging solution. Installation and configuration will consist of:

- Install and configure 5 remote locations

Finally, integration tests will be performed to ensure all components are working together.

Completion Criteria: This activity will be complete when 5 remote access components are installed and configured.

Deliverable Materials: None.

3.2.3.23 Solution Validation

Description: During this activity, The Lange Group will perform the System Test and will provide up to 40 hours of assistance to the BOC with the Acceptance Test.

- Perform System Test
- Assist with Acceptance Test

BOC will be responsible for:

- Perform Acceptance Test

Completion Criteria: This activity will be complete when the Acceptance Test executes as outlined in the Acceptance Test Plan.

Deliverable Materials: None

3.2.3.24 Procedures and Training

Description: The purpose of this activity is to plan and conduct the training for the BCIS imaging system. The following tasks will be performed:

- Conduct Train the Trainer session for the Retrieval Users

Completion Criteria: This task will be complete when The Lange Group has completed the train the trainer sessions

Deliverable Materials: none

Task 7 – Enable Remote Access to Image Data

3.2.3.25 Solution Definition

Description: The objective of the Solution Definition activity is to determine and solidify the requirements for the remote access to the BCIS imaging implementation. The following tasks will be performed in this activity:

- Facilitate up to one, four-hour configuration definition and infrastructure validation session.
- Confirm the infrastructure requirements for the remote environments. Confirm hardware and software sizing and configurations.
- Update the System Requirements Specification document.

Completion Criteria: This activity will be considered complete when the System Requirements Specification has been updated and delivered

Deliverables: Updated System Requirements Specification

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3.2.3.26 Develop Test Plans

Description: The development of the System Test Cases and Acceptance Test Plan will occur during this activity. The following tasks are included in this activity:

- Develop System Test Cases
- Develop Acceptance Test Plan
-

Completion Criteria: This activity will be complete when the Acceptance Test Plan has been delivered

Deliverable Materials: Acceptance Test Plan

3.2.3.27 Solution Generation

Description: The purpose of this activity is to install and configure necessary hardware and software components for the remote access to the imaging solution. Installation and configuration will consist of:

- Install and configure 5 remote locations for VisualInfo access

Finally, integration tests will be performed to ensure all components are working together.

Completion Criteria: This activity will be complete when 5 VisualInfo remote access components are installed and configured.

Deliverable Materials: None.

3.2.3.28 Solution Validation

Description: During this activity, The Lange Group will perform the System Test and will provide up to 40 hours of assistance to the BOC with the Acceptance Test.

- Perform System Test
- Assist with Acceptance Test

BOC will be responsible for:

- Perform Acceptance Test

Completion Criteria: This activity will be complete when the Acceptance Test executes as outlined in the Acceptance Test Plan.

Deliverable Materials: None

3.2.3.29 Procedures and Training

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Description: The purpose of this activity is to plan and conduct the training for the BCIS imaging system. The following tasks will be performed:

- Conduct Train the Trainer session for the Retrieval Users

Completion Criteria: This task will be complete when The Lange Group has completed the train the trainer sessions

Deliverable Materials: none

Task 7 b – Backfile Microfilm Integration

3.2.3.30 Conversion Requirements Validation

Task Description: Integration of the images and data provided by the Vendors chosen by the BOC to complete Part 2, Task 12 Load Back Microfilm.

- Facilitate requirements session with BOC.
- Define internal specifications
- Define procedures and programs used to import the convert microfilm images
- Implement Import program to be used
- Train two BOC users on import procedures to VisualInfo

Completion Criteria: This task will be completed when the BOC has received it's training.

Deliverables

- Requirements Definition
- Training Materials

Task 8 – Enable Public Access to Text Data

3.2.3.31 Internet Access Design Validation

Description: The objective of this activity is to validate the Internet access requirements and develop a detailed design. The following tasks will be performed in this activity:

- Research current available technology to develop the detailed design.
- Develop the Internet Access Design Document.
- Identify any new hardware and software required.
- Develop the IP addressing for Internet access.

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Completion Criteria: This activity will be considered complete when the Internet Access Design Document has been delivered

Deliverables:

- Internet Access Design Document.

3.2.3.32 Installation of Network Components for Internet Access

Description: The objective of this activity is to create working Internet access in support of the BCIS application. Tasks will include installation and customization of the following components:

- Installation and configuration of a web server
- Installation and customization of a firewall
- Installation and customization of a router for internet connection

Integration tests will be performed to ensure all components are working together.

Completion Criteria: This activity will be considered complete when all components have been installed and configured.

Deliverables: None

3.2.3.33 Solution Definition

Description: The objective of this activity is to determine the requirements for the BCIS text data implementation over the Internet. The specifications created will serve as a basis for the creation of a web based application which could be called from the DLNR Home page.

Facilitate up to two, four hour specifications sessions which will include the following:
- Define query and report formats
- Define security
- Define chargeable items
- Confirm infrastructure requirements for the production environment

These sessions will lead to the customization of a Java based application.

Assistance on the following tasks will be provided:

- BOC webmaster will develop a BOC home page and links

Completion Criteria: This activity will be considered complete when the System Requirements Specification has been delivered

Deliverables: System Requirements Specification

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3.2.3.34 Develop Test Plans

Description: The development of the System Test Cases and Acceptance Test Plan will occur during this activity. The following tasks are included in this activity:

- Develop System Test Cases
- Develop Acceptance Test Plan
-

Completion Criteria: This activity will be complete when the Acceptance Test Plan has been delivered

Deliverable Materials: Acceptance Test Plan

3.2.3.35 Solution Generation

Description: The purpose of this activity is to develop and install the Java based application which will be used by the General Public.

Completion Criteria: This activity will be complete when the Java based application is installed.

Deliverable Materials: None.

3.2.3.36 Solution Validation

Description: During this activity, The Lange Group will perform the System Test and will provide up to 40 hours of assistance to the BOC with the Acceptance Test.

- Perform System Test
- Assist with Acceptance Test

BOC will be responsible for:

- Perform Acceptance Test

Completion Criteria: This activity will be complete when the Acceptance Test executes as outlined in the Acceptance Test Plan.

Deliverable Materials: None

3.2.3.37 Procedures and Training

Description: The purpose of this activity is to plan and conduct the training for the BCIS imaging system. The following tasks will be performed:

- Conduct Train the Trainer session for the BOC

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Completion Criteria: This task will be complete when The Lange Group has completed the train the trainer sessions

Deliverable Materials: none

Task 9 – Enable Public Access to Image Data

3.2.3.38 Solution Definition

Description: The objective of the Solution Definition activity is to determine and document the requirements for the web-based access to the image system. The following tasks will be performed in this activity:

- Facilitate up to one, four-hour session to determine Web-based image requirements.
- Confirm the infrastructure requirements for the new web-based production environment. Confirm hardware and software sizing and configurations. Specific topics will include performance, availability, backup/recovery and leveraging of existing infrastructure (i.e., DNS, tape backup).
- Identify the customization necessary for the Internet imaging solution.
- Develop the Internet Requirement Specification Document.

Completion Criteria: This activity will be considered complete when the Internet Requirement Specification Document has been delivered

Deliverables: Internet Requirement Specification Document

3.2.3.39 Develop Test Plans

Description: The development of the System Test Cases and Acceptance Test Plan will occur during this activity. The following tasks are included in this activity:

- Develop System Test Cases
- Develop Acceptance Test Plan

Completion Criteria: This activity will be complete when the Acceptance Test Plan has been delivered

Deliverable Materials: Acceptance Test Plan

3.2.3.40 Solution Generation

Description: The purpose of this activity is to install and configure necessary hardware and software components for the remote BCIS access solution. Also included will be the customization tasks necessary for the remote access through the Internet. Installation and configuration will consist of:

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- Installation/Configuration of IBM's ContentConnect server software
- Customization of web component for image viewing charges

Finally, integration tests will be performed to ensure all components are working together.

Completion Criteria: This activity will be complete when all the listed components are installed and configured.

Deliverable Materials: none

3.2.3.41 Solution Validation

Description: During this activity, The Lange Group will perform the System Test and will provide assistance to BOC with the Acceptance Test.

- Perform System Test
- Assist with Acceptance Test

The BOC will be responsible for:

- Perform Acceptance Test

Completion Criteria: This activity will be complete when the Acceptance Test executes as outlined in the Acceptance Test Plan.

Deliverable Materials: None

3.2.3.42 Procedures and Training

Description: The purpose of this activity is to plan and conduct the training for the BCIS imaging system. The following tasks will be performed:

- Develop training materials
- Conduct Training on web daily operations.
- Conduct Train the Trainer session for the Retrieval Users for up to 5 users.
- Conduct training on the new network infrastructure devices

Completion Criteria: This task will be complete when The Lange Group has conducted the one day Operations training, and the half-day Train the Trainer, and network infrastructure training sessions.

Deliverable Materials: Training Materials

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Task 10 – Data Remediation

3.2.3.43   Conversion of the General Index files from mainframe

Task Description: The objective of this activity is to convert the General Index Master files for both Regular System and Land Court currently residing on the mainframe, from 1976.

- Facilitate requirements session with BOC and ICSD
- Define technical specifications
- Define procedures and programs used to import the data
- Design and develop import programs
- Transfer and import the mainframe data files to the BCIS
- Perform verification checks on the imported data

Assistance on the following tasks will be provided:

- ICSD will provide mainframe data on suitable "common" media and provide file layouts, listings or other information such as record counts etc. to verify records contained therein
- BOC will aid in spot check verification of validity of data

Completion Criteria: This task will be completed when selected data contained on the mainframe (1976 through current) is converted and accessible on the BCIS

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Deliverables: Converted Master Indexes (1976 through current)

Task 11 – GIS Requirements Study

3.2.3.44 Study Requirements

Task Description: The objective of this activity is to validate the requirements and perform a needs assessment of a GIS solution for the BOC. This shall include the formulation of a proposal based upon these needs

Completion Criteria: This task will be completed upon presentation of the results of the study and formulation of a proposal

Deliverables: Study Results & Proposal

3.2.4 The Bureau of Conveyances Responsibilities

The responsibilities listed in this section are in addition to those responsibilities specified in the *Agreement* and the items listed in Assumptions and are to be provided at no charge to The Lange Group. The Lange Group's performance is predicated upon the following responsibilities being fulfilled by BOC.

3.2.4.1 BOC Project Manager

Prior to the start of this Statement of Work, BOC will designate, in writing, a person, called the BOC Project Manager, to whom all The Lange Group communications will be addressed and who has the authority to act for BOC in all aspects of the contract. This Project Manager will also insure that appropriate BOC resources and personnel are available to provide the necessary information for this project. The responsibilities of BOC Project Manager include:

- Serve as the interface between The Lange Group project team and all BOC personnel participating in this project.

- With The Lange Group Project Manager, administer Project Change Control.

- Attend project status meetings.

- Obtain and provide information, data, decisions and approvals, within three working days of The Lange Group's request, unless BOC and The Lange Group agree to an extended response time.

- Resolve deviations from project plans that may be caused by BOC.

- Help resolve project issues and escalate issues within BOC organization, as necessary.

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- Monitor and report project status on a regular basis to BOC as appropriate.

- Provide and coordinate BOC technical resources as necessary.

- Signoff on all deliverables or provide feedback within three (3) days of receipt.

3.2.4.2 Other BOC Personnel Responsibilities

- Participate in meetings and interviews as necessary.

- Provide any additional information as is necessary for the project, as mutually agreed upon by The Lange Group and BOC.

- Help schedule interview sessions and/or meetings with identified personnel and arrange conference rooms/meeting rooms for such interviews, as appropriate.

- Review and provide input or changes to the documentation of the interview findings.

- Conduct post-interview meetings with the management team to quantify identified tangible and strategic benefits and finalize input.

- Provide subject matter experts who are knowledgeable in business processes and system architecture, including internal interfaces and API's, if required.

- Provide (through current inventory or procurement) all hardware, operating system, software, development tools and networking per an agreed-to schedule for both development and production systems.

3.2.4.3 Additional BOC Responsibilities

1. Provide suitable office space, office supplies, furniture, telephone, parking, and other facilities equivalent to those provided to BOC project team members for The Lange Group team (up to 2 physical work areas) while working on BOC premises.

2. Provide all necessary clerical and reproduction services required to support The Lange Group team while working on BOC premises.

3. Provide all necessary machine time, related services, and supplies required to support project planning, tracking, documentation, and reporting activities.

3.2.4.4 Security

BOC is responsible for the actual content of any data file, selection and implementation of controls on its access and use, and security of the stored data.

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3.2.4.5 Laws, Regulations and Statutes

BOC is responsible for the identification and interpretation of any applicable laws, regulations, and statutes that affect BOC application systems or programs which The Lange Group will have access to during this project. It is the responsibility of BOC to assure that the resulting systems and programs meet the requirement of those laws.

3.2.4.6 Required Consents and Indemnity

You will promptly obtain and provide to us all Required Consents necessary for us to provide the Services described in this Statement of Work. A required Consent means any consents or approvals required to give us and our subcontractors the right or license to access, use and/or modify (including creating derivative works) to the hardware, software, firmware and other products that you use, without infringing the ownership or license rights (including patent and copyright) of the providers or owners of such products.

You will indemnify, defend and hold us, our affiliates, and subcontractors, harmless from and against any and all claims, losses, liabilities and damages (including reasonable attorneys' fees and costs) arising from or in connection with any claims (including patent and copyright infringement) made against us, alleged to have occurred as a result of your failure to provide any Required Consents.

We will be relieved of the performance of any obligations that may be affected by your failure to promptly obtain and provide any Required Consents to us.

Phase 1 through 6 (Task 1 – Task 11)

- Provide BOC and/or ICSD personnel for training and skills transfers, so as to be capable of operating the network and systems upon completion of this Statement of Work.

- Ensure that the hardware necessary for each task is acquired before the start of the implementation of the task

- Assist in the installation and configuration activities. This assistance will consist of the database administrator actively participating in the installation of the DB2 database as well as a System Administrator involved in all installation activities and configuration of software components.

- Assist in Testing – both the System Test and Acceptance Test will take place on the installed machines before the environment becomes the Production Environment. The BOC Project Manager will ensure that users will be available to assist in the testing effort. The BOC will assist The Lange Group in the development of the Acceptance Test Cases. BOC users will be responsible for executing the User Acceptance test cases.

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- Assist in Training - the BOC Project Manager will ensure that the trainees are notified of, scheduled for, and attend the training session. Attendees should have experience using a personal computer and Windows. BOC will provide a suitable area with the installed workstations for the hands-on usage session.

- Define Backup and Recovery Procedures – The Lange Group will assist BOC in defining and documenting the backup and recovery. As part of this activity, BOC will be responsible for validating that the backup and recovery procedures are executed on a regular and timely basis.

3.2.5 Deliverable Materials

All original authored material provided by The Lange Group during the performance of this Statement of Work are the property of The Lange Group or a product or property of others who The Lange Group has a right to use and/or distribute to you. The APPX Software, Inc. license contract will be made a part of the *Agreement*.

Initial Project Plan

- Project Schedule using Microsoft PROJECT (2 –5 pages)

- Status Reports (1-2 pages)

Task 1 – Implement a Basic BOC Network

- Network Design Document

- Component List

- PC Workstations, server and switch/hub configurations

- Cabling test results

Task 2 – BCIS Requirements Verification

- System Requirements Specification Document

Task 3 – Replacement of the Regular and Land Court Systems

- RS/6000 SP node installation plan

- RS/6000 SP Control Book

- Acceptance Test Plan

Task 4 – Implementing Imaging Capability on the BOC Network

- System Requirements Specification

300561

- Acceptance Test Plan

- Training Materials

Task 5 – Implementing Imaging Capability to BCIS

- BCIS Interface Specification

- Acceptance Test Plan

- Training Materials

Task 6 – Enabling Remote Access to Text Data

- Updated Network Design Document

- Router Configuration Document

Task 7 – Enable Remote Access to Image Data

- Updated System Requirements Specification

- Acceptance Test Plan

Task 7 b – Backfile Microfilm Integration

- System Requirements Specification

Task 8 – Enable Public Access to Text Data

- Internet Requirements Specification Document

- Internet Access Design Document

- Acceptance Test Plan

- Training Materials

Task 9 – Enable Public Access to Image Data

- Acceptance Test Plan

- Updated Training Materials

Task 10 – Data Remediation

Task 11 – GIS Requirements Study

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- Needs Assessment

- Study and Presentation Materials

3.2.6 Post Implementation Support

Description: The purpose of this activity is to cutover to the Production Environment task as defined in the Statement of Work. During this activity, The Lange Group will provide the production system support as follows:

- Take problem calls and collect information about the problem. Help with determination of who to call or where the problem lies, and help with the expeditious solution of the problem.

- Assist with the collection of data to assist in the diagnosis of the problem if the solution lies with another vendor

- Advise the BOC who the appropriate vendor to contact, or help contact the appropriate vendor to open a problem report

The Lange Group will provide product support contracts for all the vendor products associated with this project. The Lange Group will have access and authorization to use the vendor support telephone numbers in the performance of it's work.

Completion Criteria:

This task will be completed at the end of the Maintenance Contract period.

Deliverable Materials: None

300563

3.3 Estimated Schedule

The estimated schedule for the overall BCIS project is twelve calendar months, as depicted at a high level in the following chart with estimated start date of January 3, 2000:

Overall Schedule	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Task 1	■	■										
Task 2	■											
Task 3	■	■	■	■	■	■	■	■	■	■		
Task 4			■	■	■							
Task 5						■						
Task 6							■					
Task 7								■				
Task 7b								■				
Task 8									■	■		
Task 9										■	■	
Task 10												■
Task 11												■

Task 1 – Implement a Basic BOC Network
    Estimated start date: January 3, 2000
    Estimated end date: February 29, 2000

Task 1	1	2	3	4	5	6	7	8
Network Design Validation								
Conduct Interviews	■	■						
Research			■					
Develop Network Design Document				■				
Identify hardware / software				■				
Develop IP addressing scheme				■				
Network Design Document				X				
Installation of Network Components								
Install Network Components					■			
Install DELL PC's w/software						■		
Install Printers						■		
Install NT Server						■		
Test connectivity						■		
Train the Trainer on PC usage								■
Training on NT, switches / hugs								■
All PC Hardware Installed								X
Installation of Cabling					■	■	■	■
Cabling Complete								X

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Task 2 – BCIS Requirements Verification
Estimated start date: January 3, 2000
Estimated end date: January 31, 2000

	Weeks			
Task 2	1	2	3	4
Requirements Verification				
Conduct Requirements Sessions	■	■	■	
Perform Structured Walk Through	■	■	■	
Create Requirements Document				■
Requirements Document				X

Task 3 – Replacement of the Regular and Land Court System
Estimated start date: January 3, 2000
Estimated end date: October 31, 2000

	Months									
Task 3	1	2	3	4	5	6	7	8	9	10
Task 1 Kickoff										
Initial Project Plan	X									
Installation of the RS/6000 Node										
Planning	■									
Installation of Hardware		■	■							
Installation of Software										
Installation Plan/Control Book			X							
Migration of K03, K06										
Migrate	■	■	■							
DB2 Setup			■	■						
Initial Test					■					
Initial Testing Compl.				X						
Convert Wang Full Data						■				
Test 1-3 months							■	■	■	
Acceptance Test Compl.										X
Convert Final Data										■
Cutover to BCIS										
Cutover to BCIS										X
Regular System & GI's										
Requirements	■									
Design		■								
Development			■	■	■					
Initial Test						■				
Test 1-3 months							■	■	■	
Production										■
Cutover to BCIS										X
Enhancements										
Development			■	■	■					
Test 1-3 months							■	■	■	
Production										■
Wang Migration Complete										X

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Task 4 – Implementing Imaging Capability on the BOC Network
Estimated start date: March 1, 2000
Estimated end date: May 30, 2000

Weeks

Task 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Initial Project Plan	X																	
Solution Definition																		
Prepare for session	■																	
Requirements Sessions	■																	
Prep for Infrastructure Session		■																
Infrastructure Design Session		■																
Confirm VI/Kofax Customization		■																
Document System Requirements			■															
Review System Requirements			■															
Update System Requirement			■															
System Requirements Spec			X															
External Design																		
Prepare for session				■														
Interface Design session				■														
Document Interface Design				■														
Deliver/Update Interface Design				■														
Interface Design Document				X														
Internal Design																		
Detailed Design of customization					■													
Develop System Test Cases					■													
Develop Acceptance Test Cases						■												
Acceptance Test Cases						X												
Solution Generation																		
Install VI Library Server		■																
Install VI Object Server			■															
Update workstations w/ VI (5)			■															
Configure VI software			■	■														
Assist with 3995s / ADSM					■													
Install Kofax Server						■												
Install Kofax Scan machine (1)							■											
Install Kofax Index machine (2)							■											
Configure Kofax software										■	■							
Customized table lookups										■	■							
Customized DB2 Release module											■	■						
Develop Retrieve Module											■	■						
Customize microfilm input											■	■						
Integration Test											■	■						
Solution Validation																		
System Test													■					
Acceptance Test														■				
Procedures and Training												·						
Prepare for Train the Trainers														■				
User T3 Training																■		
Operations Training																■		
Training Materials																X		
Solution Deployment																		■

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Task 5 – Implementing Imaging Capability on BCIS
Estimated start date: June 1, 2000
Estimated end date: June 30, 2000

Weeks

Task 5	1	2	3	4
Solution Definition	■			
Interface Specifications				
Develop Test Plans		■		
Acceptance Test Plan		■		
Solution Generation			■	
Procedures and Training				■
Training Materials				■

Task 6 – Enabling Remote Access to Text Data
Estimated start date: July 1, 2000
Estimated end date: July 31, 2000

Weeks

Task 6	1	2	3	4
Design/Install Remote Access	■			
Solution Definition				
Interface Specifications	X			
Develop Test Plans		■		
Acceptance Test Plan			X	
Solution Generation		■		
Procedures & Training				■
Training Material				X

Task 7 – Enable Remote Access to Image Data
Estimated start date: August 1, 2000
Estimated end date: August 31, 2000

Weeks

Task 7				
Solution Definition	■			
System Requirements Specification		X		
Develop Test Plans		■		
Acceptance Test Plan			X	
Solution Generation		■		
Solution Validation				■
Procedures and Training				
Training Materials				X

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Task 7 b – Backfile Microfilm Integration
Estimated start date: August 1, 2000
Estimated end date: August 31, 2000

Weeks

Task 7 b	1	2	3	4
Requirements Validation				
Confirm technical environment	■			
Review import specifications	■			
Develop system/accept test cases	■			
Develop Migration Solution				
Application Design	■			
Code/Unit Test		■	■	
System Test				■
Deliver Migration Solution				
Demonstrate/Acceptance Test				■
Acceptance Test Cases				X

Task 8 – Enable Public Access to Text Data
Estimated start date: September 1, 2000
Estimated end date: November 30, 2000

Weeks

Task 8	1	2	3	4	5	6	7	8	9	10	11	12
Internet Access Design Validation	■	■										
Internet Access Design Document			X									
Installation of Network Components			■									
Solution Definition	■	■										
System Requirements Specification			X									
Develop Test Plans			■									
Acceptance Test Plan					X							
Solution Generation					■	■	■	■	■			
Solution Validation										■		
Procedures & Training												■
Training Materials												X

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Task 9 – Enable Public Access to Image Data

Estimated start date: October 1, 2000
Estimated end date: November 30, 2000

Weeks

Task 9	1	2	3	4	5	6	7	8
Solution Definition	██	██						
Internet Requirement Specifications			X					
Develop Test Plans			██					
Acceptance Test Plan				X				
Solution Generation			██	██	██			
Solution Validation						██	██	
Procedures and Training								██
Training Materials								X

Task 10 – Data Remediation

Estimated start date: December 1, 2000
Estimated end date: December 31, 2000

Task 10	1	2	3	4
Solution Definition	██			
Develop Test Plans		██		
Solution Generation		██	██	
Solution Validation				██
Procedures and Training				
Training Materials				X

Task 11 – GIS Requirements Study

Estimated start date: December 1, 2000
Estimated end date: December 31, 2000

Task 11	1	2	3	4
Requirements Verification	██			
Perform GIS Study		██	██	██
Solution Generation		██	██	
Results of Study				X

300569

State of Hawaii

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3.4 Completion Criteria

The Lange Group shall have fulfilled its obligations under this Statement of Work when any one of the following first occurs:

- The Lange Group accomplishes The Lange Group tasks described, including delivery to BOC of the Deliverable Materials.

- A specific task will be construed to have been fulfilled if the BOC uses the deliverables including hardware and software in a production mode for greater than three months after the completion of that specific task.

- The Lange Group or BOC terminates the Project in accordance with the provisions of the *Agreement*.

3.5 Project Change Control Procedure

The following provides a detailed process to follow if a change to this Statement of Work (SOW) is required.

1. A Project Change Request (PCR) will be the vehicle for communicating change. The PCR must describe the change, the rationale for the change and the effect the change will have on the project.

2. The designated Project Manager of the requesting party will review the proposed change and determine whether to submit the request to the other party.

3. Both, The Lange Group and BOC Project Managers will review the proposed change and approve it for further investigation or reject it. The Lange Group will specify any charges for such investigation. If the investigation is authorized, the Project Managers will sign the PCR, which will constitute approval for the investigation charges. IBM will invoice BOC for any such charges. The investigation will determine the effect that the implementation of the PCR will have on price, schedule and other terms and conditions of the *Agreement*.

4. A written Change Authorization and/or Project Change Request (PCR) must be signed by both parties to authorize implementation of the investigated changes.

300570

Project Approach, Work Plan and Schedule

3.6 Changes from original Proposal

The changes that were made to this Best and Final Offer Proposal are scattered throughout, but reflects the following major changes:

- The BCIS will no longer be a standalone RS/6000 chassis but instead a "silver" wide node in the recently installed consolidated SP server at ICSD. The optional node is also a duplicate redundant "silver" node to be installed in the ICSD SP server. This fully leverages the already existing hardware installed at ICSD.

- The optional RS/6000 "silver" wide node is discussed in task 3, but planned to be acquired and installed during task 7 in an effort to spread out cost spending over time and to have the opportunity to test the SP to determine whether this item is needed

- The Optical Library provides for the initial 156GB platters installed rather than the maximum of 811GB as previously proposed due to wanting to wait for the next generation of storage media which should be faster and provide more storage capacity per platter at a lower cost, and, to defer this cost to be expended when needed in useful service

- DELL PC's were upgraded to Pentium III rather than Pentium II's

- The NT Print and File Server was upgraded to Pentium III and 550MHz rather than Pentium II 450

- The Bar Code printers were upgraded to the thermal transfer print mechanism of better quality printing

- 43 APC UPS were added so that each PC will have an UPS as well as all communication equipment on the Neighbor Island

- Attachment H represents cost plus 4.166% state excise tax and ½% reseller tax, as well as shipping and handling. BOC can purchase many of this hardware off the State's bid list rather than through The Lange Group, eliminating the ½ % tax.

- No Y2K remediation is necessary on the LCATS and K03 Receiving applications at this time. Any new enhancements to the software will include the century and be Y2K ready

- Part I phases was revamped into six phases from the original two phases, although all eleven tasks remained the same

300571

3.7   Additional Required Information (11-1-1999 ICSD Letter)

The following information is provided in response to the letter dated November 1, 1999 regarding the original RFP. The questions are restated.

1. ICSD recently installed the RS/6000 SP2 system. Leverage this recent acquisition to meet the requirements of Section 3.8 of RFP No. ICS-FY-99-052.

   Agree - Our solution fully leverages the recently acquired Consolidated SP system residing at ICSD.

2. Price schedule is to be based on an amendment to Section 3.10, IMPLEMENTATION PLAN, paragraph 1, to state:
   "The minimum expected to be completed in the initial contract period for Part 1 consists of phases determined as Phase 1 (tasks 1-3). Phase 2 (tasks 4-5), Phase 3 (tasks 6-7), Phase 4 (tasks 8-9), Phase 5 (task 10), and Phase 6 (task 11) will be contracted based upon available funding. Part 2 (task 12) will also be awarded and contracted based on availability of funding. Any remaining work shall then be contracted as supplemental agreements for phases based on available funding"

   Agree – We have provided a cost breakdown which is structured around the six phases and eleven tasks of Part 1. Our cost is based on implementation work being completed within the calendar year 2000. If work is to extend past the year 2000, there may be changes in the hourly rate and the personnel assigned to complete remaining tasks. Also, in Attachment H Recommended Hardware, Software, and Post Implementation Support, part numbers and prices will change as parts are obsoleted and promotional items become available or are cancelled. Attachment H, will change base on new parts and prices quoted by vendors at the time of order.

3. The RFP is further amended to replace Appendix B, Page B-1 (Final May 3, 1999), to correct the TERM OF CONTRACT, sentence one to state:
   "Term of contract shall be initially, and subsequently, for a period agreed upon by the contractor and the Bureau of Conveyances (BOC) to complete the work required for all phases contracted."
   Appendix B, Page B-1 (Final May 3, 1999), METHOD OF AWARD, is also amended by adding:
   "Award to be based on substantive evaluation by the Project Review Committee. Execution of Contract and Notice to Proceed will be in the manner provided for in the implementation phases. However, Notice to Proceed may be accelerated but not necessarily in the sequence described in Section 3.10 as amended."
   Will this pose a problem for you?

300572

Agree – this will not pose a problem for us except as noted in item #2 above, and provided that the prerequisite hardware and software is available to complete the task. Also, we must insure that the required staff is available and on-hand if more than two Phases overlaps.

4. Immediate and timely remediation of the new system is critical to our public servicing requirements. Programming and technical assistance located in Honolulu supports this need. Please provide a detailed schedule of post implementation charges to ensure reliable on-site response and long term support. Charges should be reflected hardware and software support that includes but is not limited to license fees, maintenance and support fees, and any recurring charges anticipated.

Agree - With the complexity of the BCIS project and the high public profile of the BOC, "skilled" local support in a timely manner, is a major requirement. Our project team consist mainly of Honolulu based staff members with the exception of Imaging. All programming and hardware support staff familiar with all aspects of the BCIS solution proposed is situated here in Honolulu. Imaging functionality skills needed in post warranty and support will be transferred to Honolulu staff members during the implementation of the BCIS.

The Lange Group, located in Honolulu, will be first level of contact for problem resolution, and will possess a high level of skill and knowledge to resolve or identify BCIS problems and issues, then assign or direct the proper personnel to remediate any issue in a timely manner. We have provided for an annual cost for on-going support by The Lange Group in Section 6 Prices, as well as all hardware and software support, including license fees, maintenance and support fees, and recurring charges, for up to three years after implementation. Note: the third year charges can be used as a basis for the continuing years.

These hardware and software related charges is further detailed in Attachment H Recommended Hardware, software, and Post Implementation Support by Task, page 8 and following pages, which deals with annual cost for Post Warranty Hardware and Software maintenance. Also note, that maintenance is listed for all hardware and software, where realistically, in some cases, purchase of a new unit would be less expensive that maintenance over a three year period.

5. Parallel testing of the new system will be conducted with no interruptions to operations. How will this be accomplished and will parallel testing involve the entire BOC staff?

Agree – parallel testing will be conducted with no interruptions to operations. Since the initial BCIS will be substantially similar in "look and feel" to the current LCATS and Receiving system, initial parallel testing should be minimal impact to the BOC users, who will be impacted mainly with navigation issues on a new

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Microsoft Windows PC based environment. Thereafter, modifications and enhancements will be installed in phases during predefined slower periods.

We have allowed for a three month overlapping test period. During the parallel testing, existing PC users will just have another icon on their Windows desktop which will access the new BCIS. Because of this, these users should be considered first, for initial testing. New PC users (users that only have the Wang workstations now), can also test on a rotating test personnel schedule, as time permits. This would be the case for the Labels and Cashiering personnel. Because of physical space limitations on their existing desks to house both the Wang and the new PC and printers, a separate training "desk" location should be setup, so that the new label printers and Microsoft Windows PC familiarity can be acquired, away from the busy operations area.

6. The RFP calls for the migration of the current LCATS (Land Court Automated Title System) information to the BCIS. Based on the above, please elaborate on how your solution accommodates and supports this requirement.

   Agree – 100% of the data contained on the Wang will be migrated to the new BCIS. Also, LCATS will have the same "look and feel" as it currently does on the Wang. This should result in the least amount disruption and user impact to the BOC users including the Hawaii FYI users.

7. Remote sites on the neighbor islands are to be fully functional. Please elaborate on your proposal, specifically equipment, communication options, hardware and software configuration requirements. Also identify potential restrictions that may be encountered. Site selections limited to Oahu (Honolulu), Kauai (Lihue), Maui (Wailuku), and Hawaii (Hilo and Kona).

   Agree – our Proposal outlines a fully functional BCIS Neighbor island implement for both data and images in Phase 3, task 5 and 6, Enabling Remote Access to Text Data and Images. Also, cost for the hardware and software necessary is listed in Attachment H Recommended Hardware, Software and Post Implementation Support.

   Remote sites are to be connected to the central site data center via a combination of ADSL and Frame Relay. In fact, the two work very well with each other. Frame Relay can be used as the overall, central "connecting vehicle," with ADSL being used as the means of accessing the "connecting vehicle."

   Frame Relay is really the service of choice that needs to be accessed by the remotes. The access means include ADSL, T1, 56K, 128K, and other speed circuits. Where available, ADSL at 384K to T1 can be the most economical choice. The one exception is the central site, where a normal Frame Relay T1 is needed. However, the capacity for supporting ADSL is dependent on the carrier,

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and the quality and distances of the local loop wires between the BOC facilities and GTE. It is our understanding that ADSL is available as a service in the locations identified (Honolulu, Lihue, Wailuku, Hilo, and Kona). However, there may still be restrictions on the cabling to each site. Any site that may be found to be non-ADSL capable, will be supportable with a direct 128K circuit to frame relay.

The central site will be configured to accept a T1 from the carrier. Hardware for this includes a Cisco 4500 Router with a 4port Serial Card, and an Ethernet connection. The serial card will access the T1 through a GDC T1/fractional T1 DSU. Remote sites capable of supporting ADSL will use only an Ethernet hub. The GTE ADSL connection is an Ethernet connection, so only a hub is required for access. These sites will still connect to Frame Relay, and, as such, connect to the central site. Non-ADSL capable sites will use a direct 128K fractional T1 circuit. These will require a Cisco 2505 router with a Serial port and 8 Ethernet ports. The serial port will connect to the 128K circuit via a GDC fractional T1 DSU. Should speeds need to be increased later, this same DSU can also accommodate speeds up to a full T1. These connections, as well as the ADSL ones, will connect to the Frame Relay T1 at Kalanimoku.

Hardware for both alternatives has been included in Attachment H Recommended Hardware, Software, and Post Implementation support for each site to ensure costs for either is covered.

8. Internet access posses security problems. Please identify the security levels included in your proposal and the problems they address. Is there a security "master" to identify different security options?

Agree – security is very important and we have addressed this issue in all levels of our solution. At the lowest level, by providing access protection in the basic architecture:

- *Separating the Web Server from the BCIS production machine*
- *Providing firewall protection for both machines*

The BCIS machine (RS/6000 SP System) will be attached to the internal BOC network, which will be protected from the Internet by an application proxy type firewall. This firewall can be configured to deny all traffic except BCIS traffic coming from the BOC Web Server. This will not only protect the BOC Server and internal network from all internet traffic, but also allow the firewall to fend off known firewall attacks, such as:

- *IP Address spooling attacks*
- *TCP SYN Flood attacks*
- *IP Source Route attacks*

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- *IP Fragmentation attacks*
- *SMTP backdoor command attacks*
- *SMTP Buffer overrun attacks*
- *Snooping of network traffic*
- *TCP Session Hijacking*
- *Attacks via download of Java applets*
- *TCP Sequence Number Prediction Attacks*
- *Information leakage by means of finger, echo, ping, SMTP and traceroute commands*
- *Random port scanning of internal systems*
- *Modification of network traffic*
- *Large packet PING attacks*
- *HTTP cgi-bin wildcard attacks and buffer overrun attacks*
- *Password replay attacks*

The firewall will create a DMZ, with the Web Server located there. This will protect the Web Server from the above attacks, as well as many others. Traffic from the Web Server to the SP BCIS machine will the retraverse the firewall, this time as SQL queries. This means that only SQL queries from the Web Server will be able to enter the internal network, and nothing else.

The Raptor firewall being proposed has extensive logging, so that reports can be developed, and actions taken (like e-mail notifications) in the event of suspicious activity.

One of our local IBM IT Specialist fastest growing specialties is security so we can definitely advise on various options. We do have extensive knowledge of security products, so if more security, or refinements are needed, additional products and solutions can be added, such as Intrusion Detection and other security management products.

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